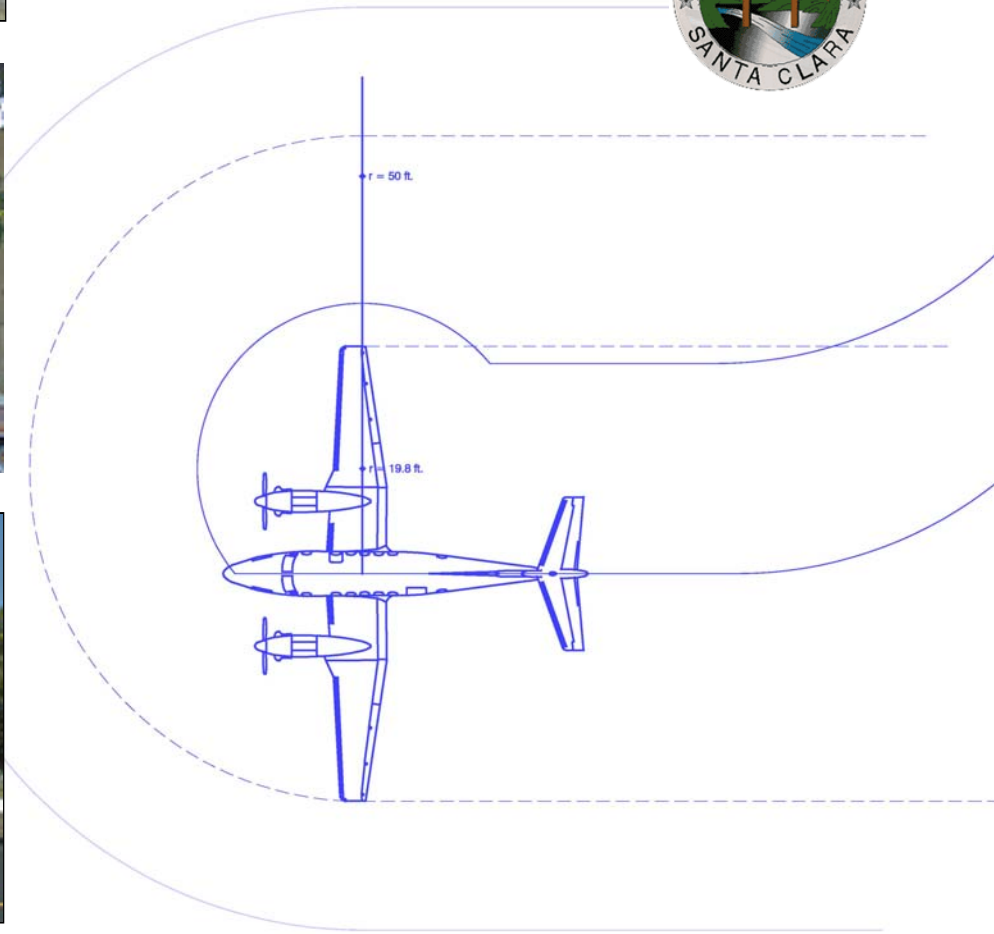
Reid-Hillview Airport Master Plan

Prepared for the
County of Santa Clara



July 2006

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David Dietz, AICP, Project Manager
Maranda Thompson, Airport Planner
Todd Eroh, Graphics Technician
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Reid-Hillview Airport Master Plan Update

Prepared
for the
County of Santa Clara

Prepared by

MEAD & HUNT

June 2007

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Chapter 1

Background and Inventory

1

Background and Inventory

REID-HILLVIEW AIRPORT

Location and Environs

Reid-Hillview Airport lies within the urban limits of the City of San Jose in Santa Clara County (Figure 1A). The Airport is located four (4) miles southeast of the city's downtown area. At an elevation of 133 feet Mean Sea Level (MSL), the Airport lies on the flat Santa Clara Valley floor, which runs through the middle of the County. The Santa Cruz Mountains bound the Airport to the west and rise to nearly 3,500 feet MSL. Copernicus Peak, the highest peak in the Mt. Diablo Range, is located east of Reid-Hillview Airport and rises to nearly 4,400 feet MSL.

The Airport is surrounded primarily by residential uses to the north, northeast, and west. Raging waters, Lake Cunningham Park, and a public golf course lie directly east of Reid-Hillview Airport, across Capitol Expressway. Tully Road and the Eastridge Mall border the Airport to the south. Several schools are located in the immediate vicinity of the Airport.

The Airport's general aviation terminal is situated off Capitol Expressway. Automobile access to Reid-Hillview Airport is via U.S. Highway 101, Tully Road and Capitol Expressway. Highway 101 connects the San Jose area to San Francisco to the north and Los Angeles to the south. Interstate Highway 680 connects the San Jose area to the East Bay.

Figure 1A

Location Map

Reid-Hillview Airport

History

Reid-Hillview Airport was originally constructed as a privately owned, public-use facility in 1939. The Airport was constructed in what was a rural area of east San Jose. In 1961, the County of Santa Clara purchased the Airport. Under County ownership and management, the Airport has been extensively enhanced. Since 1968, the Airport has been a tower-controlled facility. Presently, the Airport has two parallel runways, 726 aircraft parking spaces (i.e., tiedowns and hangars), and is a site for aviation-related and non-aviation related businesses. Additionally, the Airport serves as a Reliever Airport to San Jose International Airport to relieve congestion and to handle overflow of general aviation aircraft demand (aircraft storage and operations) from the Central Santa Clara County. The Airport's environs have also changed significantly over the last several decades. With the boom of the Silicon Valley, development has encroached the Airport on all sides.

Facilities

Reid-Hillview Airport is owned in fee by the County of Santa Clara. The day-to-day operation and management of the Airport is the responsibility of the County's Roads and Airports Department. Policy decisions affecting the Airport are made by the five-member Board of Supervisors. The Santa Clara County Airports Commission serves in an advisory capacity to the Board of Supervisors and staff on matters involving County-owned or leased airports.

The Airport encompasses 179 acres with another 19 acres controlled through easements. The airfield consists of two parallel runways and two 40-foot wide parallel taxiways on the easterly side of the runways. The Airport's air traffic control tower is located west of Runway 13R-31L. A large building area, containing nearly all of the airport buildings, is located east of Runway 13L-31R.

Runway 13L-31R is 3,101 feet in length and 75 feet wide. It is asphalt paved and has basic markings. The surface is rated at 17,000 pounds for aircraft with main landing gear in a single-wheel configuration. Runway 13L-31R is a visual runway with no instrument approaches. The runway is supported by a Medium-Intensity Runway Lighting System (MIRL) and Runway Edge Identifier Lights (REIL). To facilitate landing operations, a two-box Visual Approach Slope Indicator (VASI) with a 4.0° visual glide slope is located to the left side of Runway 13L-31R and Runway 31L.

The published dimensions for the parallel runway, Runway 13R-31L, are 3,099 feet long and 75 feet wide. The runway is asphalt paved with basic markings. The surface is rated 17,000 pounds for

aircraft with main landing gear in a single wheel configuration. Runway 13R-31L is a visual runway with no runway lighting.

Reid-Hillview Airport's principal building area is located east of the runways and backs to Capitol Expressway. The general aviation terminal and airport maintenance buildings are located near the center of the building area along the flight line. Nine (9) of the ten (10) Fixed Based Operator (FBO) buildings are located in the northern corner of the Airport. The remainder of the building area contains 96 T-hangars, 49 box hangars, and 52 aircraft shelters. Reid-Hillview Airport provides 433 tiedown spaces for both based and transient aircraft. Additionally, there are three (3) baseball fields on airport property. A summary of the facilities is presented in Table 1A.

The full range of services is available to general aviation pilots and aircraft. The available services are summarized in Table 1B.

AERONAUTICAL SETTING

Area Airports

Seven public-use airports, one private-use and one federal-use airport are located within 25 nautical miles of Reid-Hillview Airport. Of these airports, San Jose International Airport is the nearest and largest airport. Table 1C summarizes selected features of each of these airports and Figure 1B shows their location.

Area Airspace

Federal regulations define various categories of airspace with distinct operating requirements for each type. The airspace in the vicinity of Reid-Hillview Airport is relatively complex given its proximity to San Jose International Airport. As a VFR facility with an operating control tower (7:00 a.m. to 10:00 p.m.), Reid-Hillview Airport is located in Class D airspace. The Class B airspace associated with San Francisco International Airports and the San Jose Class C airspace start about one (1) nautical mile to the northwest of Reid-Hillview. The Class B airspace is more restrictive than Class C airspace. The airspace is highly controlled and air traffic control clearance is required for all aircraft to operate in this area. The airspace classifications are illustrated in Figure 1C.

MAJOR FEATURES

Property

- 179 acres owned in fee by the County of Santa Clara
- 19 acres controlled by the County through easements

Airfield

- Elevation: 133 feet Mean Sea Level (MSL)
- Runway 13L-31R: 3,101 feet long, 75 feet wide, asphalt paved
  - Threshold for Runway 13L displaced 491 feet
  - Threshold for Runway 31R displaced 400 feet
  - Medium Intensity Runway Lighting System (MIRLS)
  - Runway End Identifier Lights (REIL).
  - Visual Approach Slope Indicator (V2L – 4.00°)
  - Accommodates aircraft with landing gear in a single-wheel configuration and weighing up to 17,000 lbs.
  - Full-length parallel taxiway on east side; 150 feet from runway centerline
- Runway 13R-31L: 3,099 feet long, 75 feet wide; asphalt paved
  - Threshold for Runway 13R displaced 490 feet
  - Threshold for Runway 31L displaced 399 feet
  - No runway lighting; basic runway markings
  - Visual glide slope Indicator (V2L – 4.00°) on Runway 31L
  - Accommodates aircraft with landing gear in a single-wheel configuration and weighing up to 17,000 lbs.
- Rotating beacon; lighted wind indicator; segmented circle

Building Area

- North of runways
- Aircraft parking:
  - 433 tiedown spaces
  - 145 hangar spaces
  - 5 helicopter spaces

AIR TRAFFIC PROCEDURES

Traffic Patterns

- Right traffic pattern to Runway 13L and 31R
- Pattern altitude: 1,133 feet MSL (all aircraft)

Navigational Aids

- Woodside VORTAC: 113.70 MHz
- San Jose VOR/DME: 114.10 MHz

Communications

- UNICOM: 122.95 MHz
- Control Tower (7:am to 10:00pm):
  - 119.8 MHz (Runway 13L-31R)
  - 126.1 MHz (Runway 13R-31L)
- ATIS: 125.2 MHz

MANAGEMENT AND SERVICES

Management

- Management and maintenance provided by County of Santa Clara, Roads and Airports Department

Services

- Fuel service: 100LL, Jet-A, 80
- FBO services:
  - Aircraft maintenance
  - Aircraft rental, sales and charter
  - Aircraft storage
  - Avionics
  - Flight instruction

ENVIRONS

Topography

- Airport lies on flat Santa Clara Valley floor
- Santa Cruz Mountains located west of Airport and rise to nearly 3,500 feet MSL
- Mt. Diablo Range is located east of Airport and rises to 4,400 feet MSL

Access

- Primary access is via US Highway 101, Tully Road, and/or Capitol Expressway

Jurisdiction

- City of San Jose

Principal Land Uses

- North and west: residential uses and several schools
- East: Raging Waters, Lake Cunningham and public golf course
- South: Eastridge Mall

Source: Data compiled by Shutt Moen Associates (August 2001)

Table 1A

Airport Profile

Reid-Hillview Airport

Fixed Base Operations (Aviation-Related Services)

Name	Fuel Sales			Flight Instr'n		Aircraft Rental		Aircraft Parts & Maintenance					Aircraft Storage			Miscellaneous			
	100/100LL	Jet-A	80	Fixed Wing	Sailplane	Fixed Wing	Sailplane	Engine	Airframe	Avionics	Sailplane	Other	Based Tiedowns	Hangars	Transient Ramp	Pilots' Supplies	Charter (FAR 135)	Aircraft Sales	Other
Aero Trend, Inc.	✔												✔	✔					
Amelia Reid Aviation			✔	✔		✔							✔	✔					
Barnick Airport Properties													✔	✔					
Jurado Airport Properties													✔	✔					
Marconet Airport Properties	✔							✔	✔				✔	✔					
Nice Air, Inc.	✔	✔		✔		✔		✔	✔				✔	✔					
Trade Winds, Inc.				✔		✔		✔	✔				✔	✔		✔		✔	
Other Aviation-Related Tenants																			
2Wire Helicopter Group, LLC																	✔ [1]		
Airport Shoppe																✔			
Advance Aviation Services										✔									
Aerotech, Inc.								✔	✔										
Air Accord, Inc.				✔		✔												✔	
Civil Air Patrol																			✔ [2]
Flying S Aviation, Inc.								✔	✔										
Pierce Aircraft Sales																		✔	
Squadron Two, Inc.				✔		✔													
Turner Avionics										✔									
Vern Miller Aviation								✔	✔										
Wings International				✔		✔													

Name	***Type of Business***
Aborn Properties	Real estate and property management
Amasoft Corporation	Software consulting and training
Continuing Education Services	Healthcare licensing continuing education
Enterprise Rent-a-Car	Car rental agency
Flightstore.com	Pilot and aircraft supplies Internet retailer
Global Economic Support	Export/import wine and spirits
Gordon B. McMillan & Associates	Commercial marketing services
M.D. Wooding & Associates	Certified Public Accountant
Mr. Peabody's	Carpet cleaning
Niacomm Computers	Software consulting
V&B Transportation	Medical patient shuttle transport
Wooding Electric	Electrical contractor

[1] Helicopter Charter Service
[2] Volunteer air patrol service

Source: Data compiled by Mead & Hunt (July 2005)

Table 1B

Airport Tenants

Reid-Hillview Airport

		Location			Facilities					Services						
Airport Name	Owner	Community/County	Distance[1]/Direction	Based Aircraft	Number of Runways	Longest Runway (ft.)	Surface[2]	Lighted-Intensity[3]	Approach Visibility[4]	Control Tower	Airline Service	AvGas	Jet Fuel	Maintenance	Automobile Rentals[5]	Food
Area Airports																
Reid-Hillview	***Public***	***San Jose/ Santa Clara***	***–***	***663***	***2***	***3,101***	***Asph***	***M***	***VFR***	✓	–	✓	✓	✓	✓	–
Livermore	Public	Livermore/ Alameda	22N	547	2	5,255	Asph	M	½	✓	–	✓	✓	✓	✓	✓
Hayward Executive	Public	Hayward/ Alameda	25 NW	456	2	5,024	Asph	M	1	✓	–	✓	✓	✓	–	✓
San Carlos	Public	San Carlos/ San Mateo	24 NW	498	1	2,600	Asph	M	1	✓	–	✓	✓	✓	–	✓
Palo Alto	Public	Palo Alto/ Santa Clara	17 NW	521	1	2,443	Asph	M	1	✓	–	✓	✓	✓	✓	–
San Jose Int'l	Public	San Jose/ Santa Clara	6W	417	3	10,200	Asph	H	½	✓	✓	✓	✓	✓	✓	✓
South County	Public	San Martin/ Santa Clara	20 SE	85	1	3,100	Asph	M	1¼	–	–	✓	✓	✓	–	–
Watsonville	Public	Watsonville/ Santa Cruz	24S	331	2	4,501	Asph	M	1	–	–	✓	✓	✓	✓	✓
Moffett Field Airfield	Public	Sunnyvale/ Santa Clara	13 NW	50	2	9,200	Asph/ Conc			Federal Use						
Bonny Doon	Private	Santa Cruz/ Santa Cruz	22 SW	2	1	2,200	Asph			Private Use						

Notes:

[1] Distance limited to 25 nautical miles from Reid-Hillview Airport

[2] Asph=asphalt; Conc=concrete

[3] L=low; M=medium; H=high

[4] Statute mile

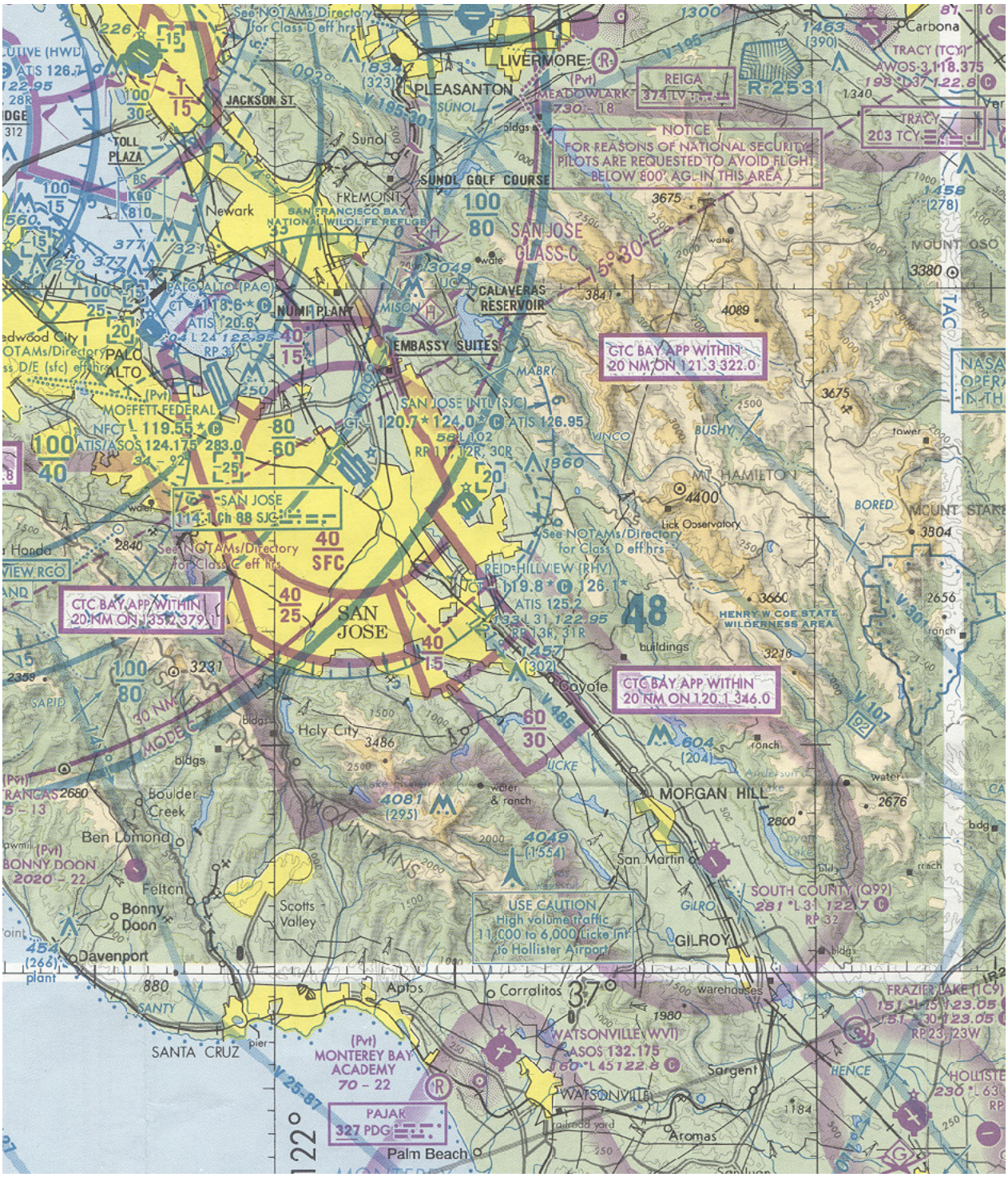
[5] On-field (outlet)

Source: Data compiled by Mead & Hunt (July 2005)

Table 1C

Area Airports

Reid-Hillview Airport Vicinity



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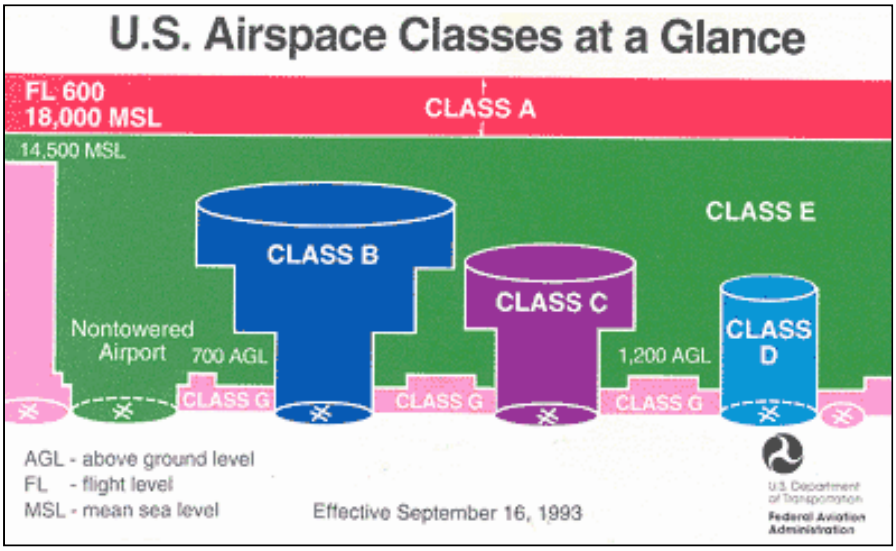
Source: San Francisco Sectional Aeronautical Chart (March 2001)

Figure 1B

Area Airports

Reid-Hillview Airport



Airspace Classes	Communications	Entry Requirements	Separation	Special VFR in Surface Area
A	Required	ATC clearance	All	N/A
B	Required	ATC clearance	All	Yes
C	Required	Two-way communications prior to entry	VFR/IFR	Yes
D	Required	Two-way communications prior to entry	Runway operations	Yes
E	Not required for VFR	None for VFR	None for VFR	Yes
G	Not required	None	None	N/A

Figure 1C
Airspace Classes

Two low-altitude Victor Airways pass near Reid-Hillview Airport: V-485 to the west and V-107 to the east. These airways provide defined routes that can be flown under instrument conditions. Pilots using these airways normally do not interact with air traffic utilizing Reid-Hillview Airport.

COMMUNITY PROFILE

Founded in 1777, the City of San Jose was California's first civilian settlement. It was also the first city to be incorporated in 1850 and the site of the first state capital. Today, San Jose is the third largest city in California with a population of nearly 924,000 and encompassing 177 square miles.

The City of San Jose has been experiencing steady growth since 1990. The community has grown by 18 percent over the last decade from 782,248 in 1990 to 923,600 residents in 2000. Comparatively, the county has grown by 16 percent and has an estimated population of just over 1.7 million as of January 2000.

Santa Clara County's local economy is supported predominantly by manufacturing, trade, and service-oriented industries. Located in the heart of the Silicon Valley, the area's specialty is in computer technology – both hardware and software. San Jose's metropolitan area is ranked second among all U.S. cities in export sales ($28.3 billion in 1999 dollars). Additional information is provided in Table 1D.

PREVIOUS AIRPORT PLANS AND STUDIES

Reid-Hillview Airport was one of three County-owned or leased airports addressed in the *Santa Clara County Airports Master Plan* (1982). The *Master Plan* examined the feasibility of providing new development (e.g., additional aircraft parking) at the Airport considering environmental and land use constraints.

In 1990, the *Reid-Hillview Airport Land Use Safety Compatibility Study* was prepared. The purpose of the *Study* was to examine the existing safety policy for Reid-Hillview Airport and to determine whether additional actions should be taken to enhance the airport/land use safety status of the Airport.

GEOGRAPHY

Location

- The city of San Jose is 177 square miles
- San Jose is located in Santa Clara County, California
- Two major cities near San Jose: San Francisco and Oakland, located approximately 44 miles and 38 miles to the north, respectively
- Other nearby cities, within 6 miles: Santa Clara (west) Campbell (south) and Milpitas (north)

Topography

- Copernicus Peak, situated in the Diablo Range, is the highest point in the San Francisco Bay Area, at 4,372 feet elevation
- San Jose is surrounded by the Santa Cruz Mountains on its western and southern borders

SURFACE TRANSPORTATION

Major Highways

- Main access into the City of San Jose:
  - US Highway 101 extending north-south
  - Interstate Highway 280, extending north-south, connects the San Jose Area to San Francisco
  - Interstate 680 and 880, also extending north-south, connects the San Jose Area to the East Bay Area

Railroads

- The City of San Jose is primarily served by the Southern Pacific and the Western Pacific Railroads

Public Transportation

- Santa Clara County Transportation Authority (VTA) offers light rail service 24 hours a day, seven days per week through the cities of San Jose, Santa Clara, and Sunnyvale and Mountain View. Free Light Rail Shuttles serve eleven employment centers
- Light Rail Service connects to VTA bus routes, employer shuttles, Caltrain commuter rail, and Altamont Commuter Express

POPULATION AND ECONOMY

Current/Historical Population

	1990	***1995***	***2000***
Santa Clara County:	1,528,600	1,597,400	1,709,500
City of San Jose:	782,224	839,300	923,600

(Source: California Department of Finance and Santa Clara County Government Website)

Projected Population

	2010	***2015***	***2020***
San Clara County:	1,987,800	2,063,000	2,163,000
City of San Jose:	--data not available--		

(Source: Association of Bay Area Governments)

Basis of Economy

- Industry groups with greatest percentage of employment in Santa Clara County:
  - Service 36%
  - Manufacturing 25%
  - Trade 19%

(Source: California Department of Finance)

CLIMATE

Temperatures

	Avg. High	***Avg. Low***
Hottest month (July):	82.1°F	56.7°F
Coldest month (January):	57.9°F	41.3°F

Precipitation

- Average annual rainfall in San Jose: 14.49 inches.

(Source: Western Regional Climate Center)

Winds

- Prevailing winds from the northwest

Source: Data compiled by Mead & Hunt (July 2005)

Table 1D

Community Profile

Reid- Hillview Airport

Chapter 2

Airport Role and Activity Forecasts

2

Airport Role and Activity Forecasts

INTRODUCTION

This version of the Airport Roles and Forecasts Discussion Paper reflects the action taken by the Santa Clara Board of Supervisors on November 19, 2002.

A key purpose of an airport master plan is to define the role of the airport. The airport's adopted role in turn drives its basing capacity, which is the type and number of aircraft that the airport will be developed to accommodate. Once a role is defined, then the facilities necessary to implement the role can be specified.

The term "role" is used in two different contexts. In a strategic context, it means the function and purpose of the airport with respect to the overall transportation network (e.g., whether the airport will be geared to small piston propeller aircraft, larger turboprops, or even business jets). In another context, it means the function of each airport with respect to accommodating growth in the number of based general aviation aircraft.

The process by which we may determine the airports' roles is outlined as follows:

- Forecast the overall demand for the airports (in terms of the number of based aircraft) over the 20-year time horizon of the Master Plan.
- Determine the hypothetical maximum basing capacity of each airport.
- Compare the forecasted overall demand to the total hypothetical maximum basing capacity of the airports.
- Identify policy alternatives available with respect to the role of each airport (i.e., the extent to which a particular airport should be developed to accommodate the forecasted demand).

- Select a role for each airport based on the Guiding Principles adopted at the beginning of the master planning process.

Airport Facility Plans based on the adopted role for each airport will be developed as part of subsequent phases of the master planning process. Appropriate environmental documentation will also be developed in accordance with the California Environmental Quality Act (CEQA).

DEMAND FORECAST

An aggregate forecast of based aircraft was prepared for the four airports in Santa Clara County: Palo Alto, Reid-Hillview, South County and San Jose International. The specific methodology is presented below.

Historical Trends – Based Aircraft

Historical data for Reid-Hillview, Palo Alto, and South County airports was taken from Santa Clara County records. Data for San Jose International Airport was taken from City of San Jose and Federal Aviation Administration records.

It is appropriate to start a discussion of forecasts with an examination of the historical record. Figure 2-1 presents the annual count of based aircraft within Santa Clara County, beginning in 1980. The early 1980s reflect the small residual growth following the boom years of the 1970s. Through the middle 1980s there was little change in the number of based aircraft, merely minor year-to-year variations. The total number of based aircraft remained slightly above 2,000. Beginning in about 1988 the number of based aircraft within the county started a slow decline. This general trend continued through the mid to late 1990s, although there were short periods of increase. The lowest recent total occurred in 1999 when the number of based aircraft dropped to 1,467. The last three years have seen an increase in based aircraft. In February 2002, the number of based aircraft countywide had increased to 1,580. Anecdotal information suggests that these may be the initial steps in a reversal of a decade-long decline. However, the current economic decline may slow the resurgence.

Historical Trends – Aircraft Operations

Operation (definition): Either a landing or a takeoff. A touch and go, a common training operation that involves a landing and an immediate takeoff without stopping, counts as two operations.

Data on aircraft operations for the three airports is readily available for all three airports back to 1978 and for Reid-Hillview back to 1968. The operations counts for Reid-Hillview and Palo Alto Airports are based upon counts made by the air traffic control tower staff. South County Airport data is based upon estimates and should be considered to be order-of-magnitude only.

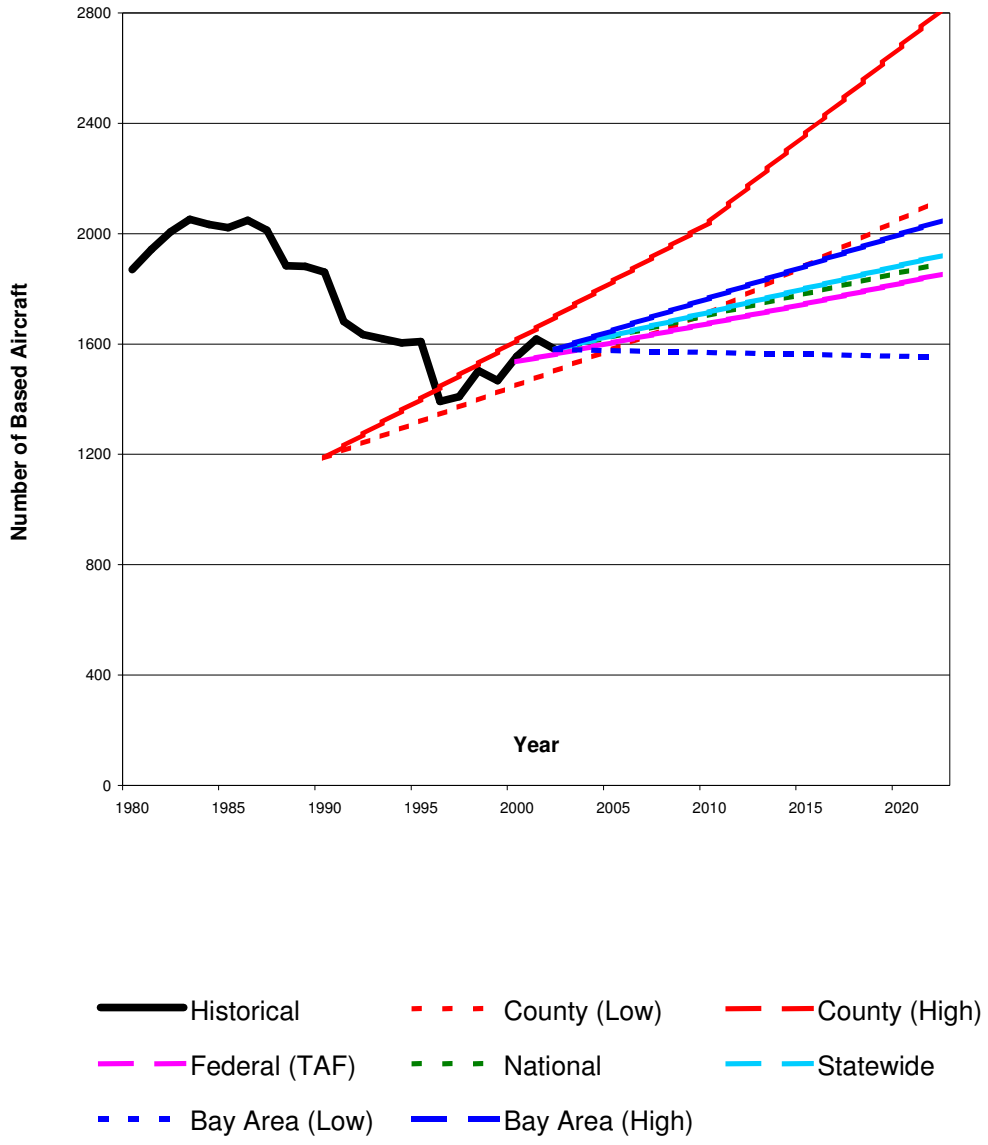


Figure 2A

Based Aircraft Demand Forecast

Santa Clara County

Some of the recent estimates for South County Airport are based upon sample counts made by Caltrans' Division of Aeronautics staff using an acoustical counter. These recent estimates can be assumed to be significantly more accurate than prior estimates.

Reid-Hillview Trends

Aircraft operations at Reid-Hillview grew fairly consistently through the late 1960s and peaked in 1978, with almost 400,000 annual operations (398,640). A very rapid decline followed with a reduction by nearly two-thirds to 137,019 operations in 1982. This was the lowest volume of operations in over 30 years. A second cycle of growth occurred through the 1980s, reaching a plateau of around 200,000 annual operations. Operations again declined, reaching its next low in 1995 with 151,916 operations. Since that time, operations have grown slightly each year. The total for the most recent year (2001) was 235,213.

Palo Alto Trends

The pattern of historical operations at Palo Alto Airport shows markedly less variation than at Reid-Hillview. There was a significant decline in operations from 1978 through 1982 (that paralleled that at Reid-Hillview): 252,425 operations to 144,223 operations. However, the percentage change was much less (44% versus 66%) than at Reid-Hillview. Following that low point, operations grew, reaching its next peak in 1990 with 240,496 operations. Again paralleling the experience at Reid-Hillview, operations declined through the early 1990s reaching its next low in 1995 with 184,285. Since that time, annual operations have hovered around the 200,000 level, with year-to-year variations as high as 10%. In 2001, the annual count was 209,709.

South County Trends

The lack of reliable data sharply limits the ability to discern trends at South County Airport. The most that can be said is that in recent years the number of operations has remained around 56,000 annual operations.

Existing Demand Forecasts

Both the Federal Aviation Administration (FAA) and Caltrans Division of Aeronautics have current forecasts of based aircraft for the four airports located in Santa Clara County. Additionally, it is appropriate to consider the FAA's national forecast for general aviation aircraft and Caltrans' statewide forecast. FAA data are

taken from the *National Plan for Integrated Airport Systems* (NPIAS), the on-line Terminal Area Forecasts, and the *Aerospace Forecasts* report. Caltrans data are taken from its *California Aviation System Plan* (CASP). Specifically, seven existing forecasts are evaluated in the paragraphs that follow:

1. NPIAS Terminal Area Forecast for airports in Santa Clara County
2. NPIAS national growth rate
3. CASP San Francisco Bay Area high forecast
4. CASP San Francisco Bay Area low forecast
5. CASP high forecast for airports in Santa Clara County
6. CASP low forecast for airports in Santa Clara County
7. CASP statewide growth rate

The Metropolitan Transportation Commission prepared forecasts of general aviation based aircraft and operations in its *Regional Airport System Plan Update*. The document provided forecasts through the year 2010. Although this document was released in 1994, it relies upon statewide data from 1988 and earlier, and national data from 1990 and earlier. This data is judged to be too old to reflect current trends and is not used in this analysis.

The FAA annually prepares Terminal Area Forecasts for all airports listed in the *National Plan of Integrated Airport Systems*. The year 2005 Terminal Area Forecasts for the four airports in Santa Clara County predict an increase in the number of based aircraft for the four airports to 1,818 by the year 2020. If this growth rate continues, the total for the four airports would reach 1854 by 2022. This growth rate is somewhat less than FAA's forecast national growth rate of about 0.9% annually. If the national growth rate occurred, the total number of aircraft based in Santa Clara County would grow to 1,782 by 2015 and 1,890 by 2022.

Caltrans' *California Aviation System Plan* (CASP) contains statewide, regional and individual airport forecasts. The most recent forecasts were published in 1999. Forecasts were prepared through the year 2010. The statewide CASP forecast was for 0.978% annual growth. The high forecast for the San Francisco Bay Area was 1.3% annual growth and the low forecast was –0.0847% annual growth. By comparison, the four airports in Santa Clara County were forecast to grow by 14% under the low forecast and 20% under the high forecast. These forecasts were extended to the year 2022, using the following methodology:

- The forecast statewide and Bay Area growth rates were applied to the actual current (2002) number of based aircraft

- The 2010 forecasts for the individual airports were extended by applying the growth rates out to 2022.

The results of this effort are forecasts for the year 2022 as follows:

2022 Forecast	Number of Based Aircraft
CASP Santa Clara County – high forecast	2,290
CASP San Francisco Bay Area - high forecast	2,046
CASP statewide growth rate	1,920
FAA – national growth rate	1,890
FAA Terminal Area Forecast – Santa Clara County	1,854
CASP Santa Clara County – low forecast	1,725
CASP San Francisco Bay Area – low forecast	1,553

Countywide Demand Forecast

Change in the number of based aircraft at any one airport is a function of newly manufactured aircraft entering the system and migration of existing aircraft between airports. The first factor is affected by the state of the economy, economic factors within the aviation industry, regulatory constraints, etc. Migration of aircraft is shaped indirectly by the larger economic factors that affect the aircraft owners. However, the single largest short-term factor currently affecting migration of aircraft within Santa Clara County is the availability of hangars. There appears to be a very large, unmet demand for hangars throughout the San Francisco Bay Area and aircraft owners are willing to drive longer distances to where they base their aircraft if they are able to obtain a hangar. In the short run, whichever airports are the first to build hangars can expect to attract aircraft from surrounding areas. In the long term, aircraft owners will try to base as close to their home (or office) as possible, assuming that cost, facilities, etc. are equal. However, given the very slow turnover in hangars, it is likely that the distribution of aircraft will never reach equilibrium where all aircraft are based at the airport most convenient to the owner.

It is appropriate to first eliminate from consideration those forecasts that do not appear to be plausible or are otherwise inappropriate. In examining the various existing forecasts, the CASP high forecast for the four airports in Santa Clara County projects the highest number of based aircraft (2,290) in the year 2022, which equates to a growth rate of about 36 aircraft per year. Over the last

three years, the number of aircraft based in Santa Clara County has increased an average of 26 aircraft per year. Therefore, the CASP high forecast for Santa Clara County is not supported by current trends and was removed from further consideration.

The CASP low forecast for the San Francisco Bay Area has a negative growth rate. In light of the positive growth rate over the last several years, this forecast was also judged inappropriate and removed from further consideration.

The FAA TAF forecasts for San Jose International and South County Airports indicate no change from current totals. The TAF forecasts for Reid-Hillview and Palo Alto both show increases over present levels. However, the most recent (2003) TAF totals for all of these airports differ significantly from the actual counts. The TAF for San Jose indicates 417 based aircraft, while only 279 are actually present. The 2003 TAF count for the other three airports were lower than actual:

- Reid-Hillview: TAF = 567; actual = 687
- Palo Alto: TAF = 458; actual = 524
- South County: TAF 70, actual = 90

Given that the most recent TAF counts for the three county-operated airports are lower than actual, this may result in TAF forecasts that understate growth trends.

In this forecast it is assumed that Moffett Federal Airfield will not serve as a base for civilian, general aviation aircraft during the 20-year span of this plan. If Moffett becomes available for general aviation aircraft, it could reduce demand at other nearby airports.

The remaining CASP forecasts, if extended to the year 2022, project between 1,725 and 2,046-based aircraft. If the current growth rate of 26 aircraft per year continued for 20 years, about 2,100 aircraft would be based in the county by 2022. However, it is believed that the current growth rate will not be sustained for 20 years. Therefore, for the purposes of this master plan, a figure between the CASP statewide growth-rate forecast and the CASP high forecast for Bay Area airports was selected. This growth rate is equivalent to an average increase of 19 aircraft per year or 1,960 based aircraft in the year 2022. This recommended forecast is 5.7% higher than the TAF forecasts for the four airports. Given that the most recent TAF count is 4.5% lower than actual, this slightly higher number can be considered consistent with the trend identified in the TAF.

HYPOTHETICAL MAXIMUM BASING CAPACITY

Determining the extent to which each airport will be developed to meet forecasted demand first requires examination of the physical constraints that affect the ability of each airport to accommodate additional based aircraft. Once the hypothetical maximum basing capacity of each airport has been established we will be in a position to compare the aggregate maximum basing capacity for the three airports against the total forecasted demand. This comparison provides the foundation for identifying policy alternatives available to the Board of Supervisors regarding the role of each airport with respect to meeting future demand. It is important to note that an airport's ability to physically accommodate additional aircraft is only one constraint affecting its ultimate basing capacity and that the hypothetical maximum basing capacity does not represent a specific plan or policy recommendation.

The following assumptions were made solely for the purpose of determining hypothetical maximum basing capacity:

- No additional real property acquisition at RHV and PAO is feasible (i.e., development would be limited to the existing airport property).
- No net change in basing capacity will occur on the airport property already developed, including the 12 Fixed Base Operator (FBO) leaseholds.
- All developable real property at RHV and PAO would be used for aircraft storage.

The additional basing capacity figures discussed below are approximate and based on preliminary site layouts and standard airport design parameters with respect to clearances, setbacks etc. The actual number of additional aircraft that could be accommodated may vary slightly.

Palo Alto Airport

Palo Alto Airport's current role is to serve light, single- and twin-engine piston aircraft. The airport also sees limited use by turboprop aircraft. The airport currently has 524-based aircraft with a capacity to accommodate up to 553 aircraft, including approximately 30 spaces needed by fixed base operators to accommodate long-term transient aircraft at the airport for maintenance and other purposes. For the purposes of this document, the 30 spaces used for long-term transient aircraft will be treated the same as spaces for permanently based aircraft in the calculation of basing capacity.

The airport is severely constrained. The presence of tidal waters near both ends of the runway makes it infeasible to lengthen the runway and only about eight acres at the south and southeast areas of the airport remain available for development. Approximately 60 aircraft storage hangars could be developed on the vacant areas, which would increase the airport's basing capacity from 553 to 613. Therefore, although there is limited potential for additional development, there is no potential to change the role of the airport to accommodate larger aircraft.

Reid-Hillview Airport

Reid-Hillview Airport's current role is to serve light, single- and twin-engine piston aircraft. The airport also sees limited use by turboprop aircraft and the smallest business jets. The airport currently has 687-based aircraft with sufficient existing capacity to accommodate a total of 726 aircraft.

The airport has 10 acres of undeveloped property in the southeast corner of the airport between the existing southernmost row of hangars and Tully Road. This property is adjacent to the existing taxiway and could accommodate an additional 167 aircraft. Total capacity for based aircraft would increase to 893.

Approximately 35 acres on the west side of the airport could accommodate an additional 136 aircraft if a new taxiway were constructed on the west side of Runway 31L/13R, bringing the hypothetical maximum basing capacity to 1,029 aircraft.

While it would be possible to extend the length of runway available for departures, it is infeasible to extend significantly the runway for landings. Therefore, it would not be possible to expand substantially the current role of the airport. The most that is physically possible is to use minor extensions to marginally increase the airport's ability to serve turboprops and small business jets.

South County Airport

South County Airport was established in the 1960s to serve as a:

- General Aviation airport to serve local users in southern Santa Clara County
- Reliever airport to serve the overflow of demand (parking and operational) from northern and central Santa Clara County

The Airport was originally envisioned as a dual-runway facility with capacity to base 550 aircraft, although the 1982 Airports Master

Plan recommended redefining the airport's role to a single-runway facility including "aircraft parking capacity commensurate with its single-runway airfield capacity." The 1982 Master Plan went on to describe how the airfield capacity could become the limiting factor with regard to the airport's basing capacity if the number of annual operations per based aircraft remained high. At 650 annual operations per aircraft, for example, only 300 or so aircraft could be based at the airport because of the throughput limitations of the single runway, even though the airport has the physical space to accommodate over 600 aircraft. At less than 650 annual operations per aircraft, basing capacity increases accordingly. This issue is discussed here because some feel that the 1982 Master Plan reduced the basing capacity at South County to 300 aircraft.

Santa Clara County is currently undertaking development of about 100 hangars at South County Airport. However, as these units do not currently exist, they are not included as existing capacity.

The airport currently serves light, single- and twin-engine piston aircraft; limited use by turboprop and the smallest business jet aircraft also occurs. The airport currently has 90-based aircraft and a total of 178 aircraft storage spaces, not including the hangars nearing completion.

Among the three County airports, South County Airport is the only one without severe physical constraints on its future development. Two scenarios were developed to illustrate the range of development that could occur at the airport, one based on the existing airport property and one based on airport expansion.

South County – Existing Property

Under this development scenario the airport would retain its current property boundaries. Approximately 45 acres are available for future development within the existing airport footprint, 32 of which would be devoted to aircraft storage while 13 acres would be reserved for FBO leaseholds. This alternative would increase the based aircraft capacity by 519 to 697 aircraft, including approximately 444 aircraft in storage hangars and 75 aircraft on FBO leaseholds.

South County - Expansion

Under this development scenario, the 38-acre parcel adjacent to the southwest part of the airport would be acquired and Murphy Avenue would be realigned. Approximately 83 acres would be available for development. About 68 acres would be devoted to aircraft storage, including large box hangars for corporate aircraft. An additional 15 acres would be reserved for FBO leaseholds and, potentially, limited non-aviation use. This alternative would increase the based aircraft capacity by 794 to 972 aircraft. This in-

cludes an increase in 694 aircraft in storage hangars and 100 aircraft on FBO leaseholds. It is important to note that although the airport would be physically capable of accommodating 972 aircraft under this scenario, airfield capacity limitations in terms of the number of annual operations would most likely limit the maximum basing capacity to less than 972 aircraft.

Existing Basing Capacity vs. Maximum Basing Capacity

Airport	Existing Basing Capacity	Increase in Basing Capacity Possible	Maximum Basing Capacity
Palo Alto	553	60	613
Reid-Hillview	726	303	1029
South County	178	519-794	697-972
Totals	1457	882-1157	2339-2614

San Jose International Airport

San Jose International Airport currently has 279-based aircraft. The number of based aircraft has been declining in recent years due to elimination of hangars and tiedowns, increasing rental rates, and conversion of FBOs from flight schools to uses oriented towards business jet aircraft. The current SJC master plan adopted in 1997 forecast that the number of general aviation aircraft based at the airport would decline to 320 by 2010.

Since the current number of based aircraft has already fallen below the level forecast in the master plan, there is no source of official guidance on whether the number will decrease further and, if so, by how much. However, it is likely that the number of based aircraft will continue to decline even if the airport does not eliminate any additional publicly owned hangars or tiedowns. Fee increases, continued conversion of FBOs to uses oriented towards business jets and increased security measures are likely to encourage significant further relocation of smaller general aviation aircraft. For the purposes of evaluating demand at the airports operated by Santa Clara County, it will be assumed that the number of aircraft based at San Jose International will be reduced by an additional 100 aircraft by the year 2022. This would reduce the capacity at San Jose International to 179-based aircraft.

MEETING DEMAND – ALTERNATIVES

Earlier in this chapter, we forecasted the countywide demand for based aircraft to reach 1,960 by the year 2022. To fully meet this demand, the four public-use airports would need to provide aircraft storage facilities for 1,960 aircraft. Based upon the preceding analysis, San Jose International Airport (SJC) is forecast to have only 179 general aviation aircraft in the year 2022.

Since the number of general aviation aircraft based at SJC is driven in large part by the previously adopted Master Plan for that airport, we assume that the County has very limited ability to influence this number. This means that space for 1,781 aircraft will need to be provided at the three airports operated by Santa Clara County, if demand is to be met (1,960 – 179 = 1,781). Current capacity at the three airports is 1,457. Therefore, there will be a need for space for 324 additional aircraft if the demand is to be fully accommodated.

Since the preceding section established that the three County airports have the ability to accommodate within their existing boundaries up to 882 additional aircraft – over twice the forecasted growth in demand - some latitude exists regarding the extent to which each airport could be developed to accommodate the aggregate demand. In this section, alternatives to the current capacity and role are presented for each of the four airports in Santa Clara County.

GUIDING PRINCIPLES

On April 27, 1999, the Board of Supervisors adopted a set of principles to guide the master planning process. Discussion of these Guiding Principles is appropriate since they represent values to be applied to the available alternatives and will therefore influence to a great degree which alternatives are selected. The following summarizes the Guiding Principles:

- **Financial Self-Sufficiency**. The Airport Enterprise Fund should be self-sustaining without subsidy from the County General Fund. Revenue from fees and charges, state and federal grants and other sources should be sufficient to fund operating and maintenance costs, capital improvements and an appropriate level of reserves.

  The principle of financial self-sufficiency forges an inextricable link between the Master Plan and the Business Plan. Although the Master Plan focuses primarily on the role of each airport

and the subsequent capital improvements necessary to fulfill that role, the influence of these decisions on the Business Plan must be understood in order to properly coordinate the two Plans.

The Board may also wish to formally expand this principle to require that each airport maintain financial self-sufficiency to the maximum extent practicable.

- **Preserving the Quality of Life.** The safekeeping of the quality of life of residents who live near County-operated facilities is important.

  Since this issue is directly related to the number of operations, forecasting the number of operations for various levels of based aircraft is an integral part of the decision-making process.

- **Maintenance of Safety Zones**. Maintaining the integrity of our safety zones by discouraging the encroachment of incompatible land uses will maintain the safety of airport users as well as those persons who live or work nearby.

  Since we have determined that it is infeasible to expand either Palo Alto or Reid-Hillview beyond their current boundaries and the area surrounding both airports is already at its ultimate state of development, this issue will not be a factor in the selection of a role for each airport. However, the Master Plan will consider the potential acquisition of property to ensure adequate safety zones.

- **Meeting the Needs of the Aviation Community**. Considering the needs of the aviation community with respect to basing capacity and airport operational issues (including availability of on-airport services) is an integral part of the master planning process.

  This element of the master planning process is concerned primarily with meeting the forecasted need for basing capacity. The needs of the aviation community with respect to specific services offered at the airports (whether by the County or the FBOs) are the subject of future phases of the Master Plan.

RANGE OF ALTERNATIVES

The South County hangar project currently under design could in itself satisfy almost one-third of the forecasted growth in demand for based aircraft storage by providing about 100 of the 324 additional spaces needed to meet the 2022 forecasted demand of 1,781 spaces. Upon project completion, only 224 additional spaces would be required over the next 20 years to meet the forecasted demand.

The extent to which the basing capacity is increased at each airport – or not increased, as the case may be – is a policy decision of the Board of Supervisors. Fortunately, a wide range of alternatives is available to the Board. Three broad approaches are discussed below:

1. **Develop each airport based on its own demand**. This approach focuses on developing each individual airport based on the demand for basing capacity at that particular airport. Although the total forecasted growth in demand for based aircraft storage at the three County airports is 324, it is reasonable to assume that, absent constraints on basing capacity, demand for spaces at each individual airport would approximate the existing distribution of aircraft.

   However, we know that Palo Alto's basing capacity could be expanded by a maximum of 60 aircraft. Therefore, the forecasted growth in demand cannot occur with the same distribution pattern that currently exists, and the basing capacity of Reid-Hillview and South County combined would need to increase by 264 to meet the forecasted demand (60+264=324). If we assume that aircraft owners unable to base their aircraft at Palo Alto would look first to Reid-Hillview as an alternative home base and then to South County, we could expect the Year 2022 distribution of based aircraft shown in the following table:

Table 2A: Alternative 1

Develop Each Airport Based on Its Own Demand

Airport	Existing Basing Capacity	Change in Basing Capacity	Year 2022 Number of Based Aircraft	Year 2022 Distribution of Based Aircraft
Palo Alto	553	+60	613	34.4%
Reid-Hillview	726	+174	900	50.5%
South County	178	+90	268	15.1%
Totals	**1457**	**+324**	**1781**	**100.0%**

2. **Designate South County Airport to accommodate all of the forecasted growth in demand**. This approach attempts to direct the anticipated increase in demand for basing capacity to South County. South County could both accommodate the entire forecasted increase in demand plus expand its role with respect to the type and size of aircraft it could accommodate entirely within its existing boundaries. If the airport boundary is expanded through the acquisition of adjacent property, basing capacity and on-airport facilities and services could expand even further. The following table illustrates the Year 2022 distribution of based aircraft resulting from this alternative:

Table 2B

ALTERNATIVE 2:
Designate South County Airport to Accommodate All Forecasts Growth In Demand

Airport	Existing Basing Capacity	Change in Basing Capacity	Year 2022 Number of Based Aircraft	Year 2022 Distribution of Based Aircraft
Palo Alto	553	0	553	31.0%
Reid-Hillview	726	0	726	40.8%
South County	178	+324	502	28.2%
Totals	**1457**	**+324**	**1781**	**100.0%**

3. **Develop policies that combine elements of Alternatives 1 and 2.** Alternatives that combine elements of the two approaches are possible as well. For example, even if South County is selected to accommodate the majority of growth in demand for basing capacity, building additional hangars at Palo Alto should be considered, for example, to make that airport financially self-sufficient. The following table illustrates one example of the Year 2022 distribution of based aircraft that could result from this alternative:

Table 2C

ALTERNATIVE 3:
Develop Policies that Combine Elements of Alternatives 1 and 2

Airport	Existing Basing Capacity	Change in Basing Capacity	Year 2022 Number of Based Aircraft	Year 2022 Distribution of Based Aircraft
Palo Alto	553	+60	613	34.4%
Reid-Hillview	726	+24	750	42.1%
South County	178	+240	418	23.5%
Totals	**1457**	**+324**	**1781**	**100.0%**

In all three scenarios our approach up to this point has been focused on how to meet future demand for additional aircraft storage, but it is important to avoid exceeding demand as well. The marketplace attempts to reach equilibrium between supply and demand and we know that other airports on the periphery of Santa Clara County are planning construction of hangars in the near term:

- San Carlos Airport expects to build 40 units in the next two years and an additional 80 units within 5 years
- Hayward Executive Airport plans to construct 43 T-hangars within the next two years and is seeking developers for 20 box hangars
- Hollister Airport has just completed construction of 28 T-hangars and expects to construct 25 - 30 additional T-hangars and 6 - 8 box hangars within 5 years

In the short term, these adjacent airports can expect to receive some of the aircraft whose owners would prefer to locate in Santa Clara County but cannot because space is not available. In the long term, some redistribution could be expected to take place.

BOARD OF SUPERVISORS' DIRECTION

At its meeting on November 19, 2002, the Santa Clara County Board of Supervisors adopted Alternative 3 to guide development of airport master plans for the three county-operated airports. The Board believes that this alternative would best meet the following overall objectives, which conform to the Guiding Principles:

- Achieve greater parity in the distribution of based aircraft to preclude disproportionate quality of life impacts at any one airport;
- Meet the needs of the aviation community by accommodating all of the forecasted growth in demand for basing capacity;
- Ensure the Airport Enterprise Fund remains self-sustaining without subsidy from the County General Fund.

Table 2D

Countywide Based Aircraft Forecast

Airport	Existing Basing Capacity	Previous Master Plan Basing Capacity	Change in Basing Capacity*	Year 2022 Number of Based Aircraft*	Year 2022 Distribution of Based Aircraft
Palo Alto	553	590	+23	613	31.3%
Reid-Hillview	726	900	-150	750	38.3%
South County	178	550	-132	418	21.3%
San Jose Int'l	279	804	-625	179	9.1%
Totals	**1736**	**2844**	**-884**	**1960**	**100.0%**

* The Airport Master Plan forecasts for San Jose International Airport adopted by the City of San Jose do not extend to 2022. The forecasted change in basing capacity and based aircraft were developed by Santa Clara County as part of this master plan process and reflect current trends at San Jose International Airport.

The above table is based on the demand forecast of 1,960 aircraft by the Year 2022 and will require adjustment if the demand forecast changes. Staff recommends re-forecasting demand every five years.

Comparisons with Individual Airport TAF Forecasts

While the TAF total for Santa Clara County differs by only 5.7% from the master plan forecast, the assumed allocation among airports does differ more significantly.

The 2020 TAF forecast for Palo Alto shows a growth of 64 based aircraft. These master plan forecasts anticipate an increase of 89 based aircraft.

The 2020 TAF forecast for Reid-Hillview shows a growth of 242 based aircraft. These master plan forecasts anticipate an increase of 63 based aircraft.

The 2020 TAF forecast for South County shows no change in based aircraft. These master plan forecasts anticipate an increase of 328 based aircraft.

The 2020 TAF forecast for San Jose International shows no change in based aircraft. These master plan forecasts anticipate a decrease of 100 based aircraft.

Forecasted Annual Operations at Recommended Basing Capacity

An airport's impact on the surrounding community is proportional to the number of annual operations, which is a function of the number of based aircraft. Since the purpose of this phase of the master planning process is to determine the role — and therefore the basing capacity — of each airport, it is important to know how a change in based aircraft would affect the number of annual flight operations. This section forecasts the number of annual flight operations that would occur if the airports were at their recommended basing capacity.

Forecasts of annual aircraft operations at the recommended basing capacity have been developed by multiplying the recommended number of based aircraft by a ratio of annual operations per based aircraft. Unique ratios were developed for each airport based upon historical data. This ratio reflects the many factors that shape the volume of operations at an airport:

- The amount of training activity
- The volume of transient aircraft
- Congestion
- Weather cycles
- Availability and quality of instrument approach procedures
- The number and quality of aviation businesses
- Proximity to pilots' residences

Two general principles affect the operations per based aircraft ratios:

- As the number of based aircraft increases, the average number of operations per based aircraft will decline due to congestion, especially as activity levels approach the operational capacity of the runway(s).
- Flight training generates more operations per based aircraft than recreational or business flying.

In the previous discussion regarding hypothetical maximum basing capacity, we assumed that all developable property at RHV and PAO would be used for aircraft storage (i.e., none of the property would be made available for aviation businesses, including new flight schools). Therefore, each additional based aircraft would generate on average fewer annual operations than the existing mix of based aircraft, which includes aircraft used primarily for flight training. Therefore, we may conclude that the number of annual

flight operations would not change in the same proportion as the increase in the number of based aircraft.

Reid-Hillview

There are currently about 342 annual operations per based aircraft at Reid-Hillview Airport with 687-based aircraft. The following table summarizes the forecasted annual operations per based aircraft and total annual operations for the existing level of based aircraft, the current basing capacity, and the 2022 recommended basing capacity.

Table 2E

Forecasted Operations for Reid-Hillview Airport

Scenario	Based Aircraft	Annual Operations per Based Aircraft	Total Annual Operations
Existing Based Aircraft	687	342	235,213
Existing Capacity	726	333	241,882
Recommended Capacity	750	328	245,986

The 2020 TAF operations forecast for Reid-Hillview is 290,061. If the forecast trend was extended to 2022 the total would be 298,406. Therefore, the maser plan forecast is over 50,000 lower than the trend implicit in the TAF forecast.

Palo Alto

There are currently about 400 annual operations per based aircraft at Palo Alto Airport with 524-based aircraft. The following table summarizes the forecasted annual operations per based aircraft and total annual operations for the existing level of based aircraft, the current basing capacity, and the 2022 recommended basing capacity.

Table 2F

Forecasted Operations for Palo Alto Airport

Scenario	Based Aircraft	Annual Operations per Based Aircraft	Total Annual Operations
Existing Based Aircraft	524	400	209,709
Existing Capacity	553	390	215,509
Recommended Capacity	613	371	227,509

The 2020 TAF operations forecast for Palo Alto is 243,862. If the forecast trend was extended to 2022 the total would be 247,495. Therefore, the maser plan forecasts are about 20,000 lower than the trend implicit in the TAF forecast.

South County

There are currently about 630 annual operations per based aircraft at South County Airport with 90-based aircraft. The very high number of annual operations per based aircraft reflects the low number of based aircraft relative to the high volume of training activity — much of it generated by aircraft based at other airports. The following table summarizes the forecasted annual operations per based aircraft and total annual operations for the existing level of based aircraft, the current basing capacity, and the 2022 recommended basing capacity:

Table 2G

Forecast Operations for South County Airport

Scenario	Based Aircraft	Annual Operations per Based Aircraft	Total Annual Operations
Existing Based Aircraft	90	630	56,708
Existing Capacity	178	500	89,000
Recommended Capacity	418	420	175,560

The TAF for South County Airport forecasts no growth in operations from its current estimate of 55,000 annual operations. The master plan forecasts are higher by 120,000 annual operations.

SUMMARY OF FORECASTS

Table 2H presents a summary of the 20-year forecasts presented earlier in this chapter. It also contains forecasts of intermediate years. A brief description of the factors that shaped the forecast for each airport is presented.

Reid-Hillview Airport

This airport's location in a dense suburban residential area makes significant increases in based aircraft and operations inappropriate. No new acreage will be allocated to fixed base operators, so increases in training activities are not anticipated. A limited number

of new hangars will increase the level of activity slightly during the 20-year planning period.

Palo Alto Airport

This airport is constrained by the levees that protect the facility from San Francisco Bay. There is limited ability to accommodate additional aircraft. The small growth in activity will come from the creation of hangars or an additional fixed base operator on the remaining unutilized land.

South County Airport

The current hangar project will add about 100 based aircraft. These hangars are expected to be occupied in 2005. Continued growth in based aircraft is expected to occur as additional hangars become available; demand is very high. The addition of one or more fixed base operators will become more likely following extension of the runway. The anticipated addition of high-end golf courses and estate homes in the area is expected to generate increase use by turboprops and small jets. Over the long term, development of commercial and industrial uses in the San Jose-Gilroy corridor will also boost activity levels.

Table 2H

Master Plan Activity Forecasts

	Current 2002	5-Year 2007	10-Year 2012	20-Year 2022
Based Aircraft				
Reid-Hillview Airport	687	695	720	750
Palo Alto Alto Airport	524	540	575	613
South County Airport	90	210	310	418
Total	1301	1445	1605	1781
Annual Aircraft Operations				
Reid-Hillview Airport	235,213	238,000	241,000	245,986
Palo Alto Alto Airport	209,709	215,000	221,000	227,509
South County Airport	56,000	95,000	135,000	175,560

Source: Mead & Hunt, January 2005

Chapter 3

Airfield Design

3

Airfield Design

OVERVIEW

Due to the presence of significant physical constraints, little change to the existing airfield is anticipated. The emphasis in this plan is on identifying airfield improvements that will enhance safety and provide for more orderly aircraft ground movements. Proposed modifications include expanding the Runway Safety Areas and Object Free Areas at the south end of the parallel runways to meet standards and adding a west side parallel taxiway.

BASIC DESIGN FACTORS

The Federal Aviation Administration (FAA) provides guidance for airport design through a series of Advisory Circulars. These guidelines promote airport improvements that enhance airport safety and operational utility for the types of aircraft currently using or anticipated to use the airport on a regular basis. Major considerations include:

- Airport role
- Airport classification
- Prevailing winds

Airport Role

The airport's role — that of a general aviation airport serving small aircraft — is well established and is not expected to change. Moreover, the maximum basing capacity of 750 aircraft established earlier in the master planning process is only slightly higher than the current basing capacity of 726 aircraft. Therefore, neither the

runway's Airport Reference Code (see discussion below) nor design aircraft are proposed to be modified. The purpose of the proposed airfield improvements is to enhance the airport's established role.

Airport Classification

Aircraft Approach Category

- Category A: aircraft approach speed less than 91 knots.
- Category B: speed 91 knots or more but less than 121 knots.
- Category C: speed 121 knots or more but less than 141 knots.
- Category D: speed 141 knots or more but less than 166 knots.
- Category E: speed 166 knots or more.

Airplane Design Group

- Group I: wingspan up to but not including 49 feet.
- Group II: 49 feet up to but not including 79 feet.
- Group III: 79 feet up to but not including 118 feet.
- Group IV: 118 feet up to but not including 171 feet
- Group V: 171 feet up to but not including 214 feet.
- Group VI: wingspan greater than 214 feet.

For airfield design purposes, the Federal Aviation Administration has established a set of airport classifications known as Airport Reference Codes (ARC) applicable to each airport, and its individual runway and taxiway components. The primary determinants of these classifications are the most critical types of aircraft (design aircraft) a runway or taxiway is intended to serve, and the instrument approach minimums applicable to a particular runway end. Each Airport Reference Code consists of two components relating to an airport's design aircraft:

- **Aircraft Approach Category –** Depicted by a letter (A-E), this component relates to aircraft approach speed, an operational characteristic that provides an indication of runway length requirements.
- **Airplane Design Group –** Depicted by a Roman numeral (I-VI), the second component relates to airplane wingspan, a physical characteristic.

Generally, Aircraft Approach Category applies to runways and runway related facilities. Airplane Design Group primarily relates to separation criteria involving taxiways and taxilanes. FAA standards also distinguish between small aircraft (i.e., those weighing 12,500 pounds or less) and large aircraft (i.e., those weighing more than 12,500 pounds).

Design Aircraft

Beech King Air

The FAA defines the design aircraft as the most demanding aircraft using the airport or expected to use the airport on a regular basis (at least 500 annual operations). Historically, twin-engine, turboprop aircraft have been the most demanding aircraft to regularly use Reid-Hillview Airport. The Beech King Air B100 is typical of this class of aircraft. The King Air has an approach speed of 111 knots, a wingspan of 45.8 feet, and a gross weight of 11,800 pounds. The Airport Reference Code for this aircraft is ARC B-I (small). For airfield planning purposes, the operational and physical characteristics of the design aircraft – approach speed, wingspan and weight – are tied directly to the design criteria for the length, width and strength of the runways, respectively.

Instrument Approach Minimums

Reid-Hillview Airport is served by one straight-in instrument approach procedure. The procedure is an RNAV/GPS approach to Runway 31R. This approach requires minimum forward visibility of 1¼ miles and minimum descent altitude of 1,309 feet above the airport elevation. There is also a circle-to-land approach with similar minimums that can be used for either end of Runway 13L-31R. Given the constraints of terrain, runway length, and proximity to San Jose International Airport, it appears unlikely that the minimums for instrument approaches to Reid-Hillview Airport will be reduced (i.e., improved) much in the future; an evaluation of the airfield implications of an approach with minimums less than ¾ mile visibility (i.e. precision approach criteria) is therefore not addressed in this document.

Prevailing Winds

Federal Aviation Administration standards recommend development of a crosswind runway when the primary runway does not provide 95% wind coverage. Wind coverage is based upon the maximum crosswind permitted each class of aircraft. As noted above, the design aircraft for the runways at Reid-Hillview Airport is a Beech King Air B100. This aircraft is in ARC B-I. The maximum crosswind component for this category is 10.5 knots (12 miles per hour). Based upon available wind data, Reid-Hillview Airport's runways have 98.75% wind coverage for this level of crosswind. Therefore, it can be concluded that a crosswind runway is not justified.

RUNWAYS 13L-31R AND 13R-31L

Classification

As noted earlier, the most demanding aircraft that regularly uses Reid-Hillview Airport currently are twin-engine turboprop aircraft, such as the Beech King Air. For runway design purposes, the FAA has defined *regularly* as more than 500 annual operations. This design aircraft will not change over the life of this plan. The Beech King Air is in ARC B-I (small). Therefore, runway design criteria for ARC B-I (small) have been used in this plan.

Runway Length

Runway 13L-31R is currently 3,101 feet long, while Runway 13R-31L is 3,099 long. Both runways have displaced thresholds at both

ends. The displaced thresholds for Runway 13L and 13R were established to increase the height of aircraft over the adjacent park and residential area when landing from the north. The displaced thresholds for Runway 31R and 31L were designed to provide clearance over Tully Road and the airport perimeter fence for aircraft landing from the south. The threshold locations and landing distances are as follows:

- Runway 13L has a 491-foot displaced threshold which leaves 2,610 feet available for landings
  - Runway 13R has a 490-foot displaced threshold which leaves 2,609 feet available for landing
  - Runway 31R has a 400-foot displaced threshold which leaves 2,701 feet available for landing
- Runway 31L has a 399-foot displaced threshold which leaves 2,700 feet available for landing

The FAA's runway length design software lists the following lengths for a runway with Reid-Hillview's elevation and mean maximum temperature that is designed to serve small aircraft with less than 10 seats:

- 75% of these small aircraft 2,480 feet
- 95% of these small aircraft 3,040 feet
- 100% of these small aircraft 3,610 feet

As this class of aircraft typically requires less runway length for landings than takeoffs, both runways' lengths are adequate to serve slightly over 95% of the types of aircraft that they are intended to serve. Therefore, no increase in runway length is required.

Runway Width

Both runways are currently 75 feet in width, which meets FAA standards for runways with ARC B-I and B-II. No change to the existing runway width is recommended.

Pavement Strength

Both of Reid-Hillview's runways have a design strength of 17,000 pounds for aircraft with single-wheel main gear. No design strength has been designed for aircraft with multiple wheels on their main gear. This strength is slightly higher than required, but consistent with the role of the airport. No change is required.

AIRFIELD DESIGN ELEMENTS

Runway Safety Areas

Runway Safety Area (RSA) dimensions are based upon the ARC and instrument approach minimums. With an ARC of B-I (small) and 1¼ mile visibility minimums, FAA design standards require a runway safety area that is 120 feet wide and extends 240 feet beyond each runway end. Since the runways at RHV are not centered on the airport property, both runways meet this standard at their northern ends but not at their southern ends due to the proximity of the airport's perimeter fence along Tully Road. Runway 13L-31R has only approximately 147 feet clear beyond the runway end, while Runway 13R-31L has about 161 feet. The FAA views substandard RSAs as a serious problem and can be expected to require some form of formal resolution of the current condition as part of this master plan process.

Runway Safety Area (RSA) — A cleared, drained, graded, and preferably stabilized surface, symmetrically located around a runway. Under dry conditions an RSA should be capable of supporting the passage of aircraft without causing major damage to the aircraft.

In RHV's particular situation, the only practical way to enlarge the RSAs physically to meet FAA standards without shortening the usable runway length is to "shift" the runways to the north. If the standards are not met, an FAA modification to standards must be obtained. It is uncertain whether the FAA would grant a modification to standards in this circumstance.

Shift Runways to North

The least complex way to create 240-foot long RSAs at the southerly end of each runway would be to remove the southerly 93 feet of Runway 13L-31R and the southerly 79 feet from Runway 13R-31L and replace this amount at their respective northern runway ends. This would "shift" both runways to the north just enough to provide full-length RSAs at both ends as if each entire runway were picked up and moved to the north. The displaced thresholds would be retained in their same positions relative to the runway ends. In other words, the runways would be physically identical in every respect to the existing runways but would be more centered on the airport property.

The drawback of this small shift in the runways is that the airport noise contours would shift by about the same amount. Several homes that are currently just outside of the 65 CNEL contour would become eligible for federally-funded noise insulation. Additionally, aircraft departing to the north would be about 5 feet lower as they overfly the park and residences. The change in noise levels and overflight altitude are so small that they would be difficult for area residents to perceive. However, at the community workshop held in May 2004, those area residents who attended strongly favored not shifting the southern runway ends. Retaining

the existing southern runway ends at their current location would mean that aircraft departing to the north would retain their current altitude and flight paths.

Based upon the strong community preference, it is proposed to shift the northern runway ends as previously discussed, but retain the present southern runway ends' locations. The displaced threshold markings would be shifted the same amount as the northern runway end. This would ensure that the current landing distances would remain unchanged.

Modification To FAA Standards

FAA approval is required if RSAs meeting FAA design standards are not created. The FAA would evaluate the proposed departure from standards to determine if a reasonable level of safety would be maintained. If a modification to standards were obtained, no changes to the runway, runway markings or lighting would occur. However, the FAA is unlikely to approve a modification to standards unless it is physically impossible to create complying RSAs.

Object Free Areas

Object Fee Area (OFA) — A two-dimensional surface surrounding runways, taxiways, and taxilanes. OFA clearing standards preclude parked aircraft or other objects, except for objects that need to be located within the OFA for air navigation or aircraft ground maneuvering. The OFA should be under the direct control of the airport operator.

FAA standards for runways with ARC B-I (small) with visibility minimums of not lower than ¾ mile visibility specify that the Object Free Area be 250 feet wide (centered on the runway) and extend 240 feet beyond the runway end. As the OFAs for Reid-Hillview's runways are as long as their RSAs, but wider, they are also substandard at the runway's south end.

Fortunately, adequate OFAs can be created by shifting the runways just a few feet more than is necessary to meet RSA standards. Shifting Runway 13L-31R 95 feet (two feet more than the 93 feet required for the RSA) and shifting Runway 13R-31L 82 feet (three feet more than the 79 feet required for the RSA) would create adequate OFAs. As a practical matter, shifting both runways by the same amount - 95 feet - would avoid having runways that are staggered by 13 feet, thereby keeping the taxiways and other markings identical for both runways.

Obstacle Free Zones

As with RSAs and OFAs, the dimensions of obstacle free zones (OFZs) vary depending upon the size of aircraft served, and the visibility minimums of any associated instrument approaches. At Reid-Hillview, OFZs for the two runways are 250 feet wide (like the OFA), and extend 200 feet beyond each runway end. Again, as

with the RSAs and OFAs, the fence at the runway's eastern end intrudes into the OFZs.

The means of addressing the substandard OFZs is the same as for the substandard RSAs. However, unlike RSAs, the FAA is commonly more willing to consider modifications to standards for OFZs.

Shifting of the runways as recommended will eliminate the current substandard condition. No modifications to standards would be required.

FAR Part 77 Imaginary Surfaces

Federal Aviation Regulations (FAR) Part 77, *Objects Affecting Navigable Airspace*, identifies the airspace necessary to ensure the safe operation of aircraft to, from, and around airports. This airspace is defined for each airport by a series of imaginary surfaces. The dimensions and slopes of these surfaces depend on the configuration and approach categories of each airport's runway system. Generally, most critical among the FAR Part 77 surfaces are the approach surfaces.

No objects penetrate the approaches to Runway 13L and 13R. The displaced threshold exists to minimize noise impacts on uses underlying approaches from the north. Numerous objects penetrate the Part 77 surfaces in the approaches to Runway 31R and 31L. The landing threshold was displaced to provide adequate clearance over the objects in the approaches.

As noted earlier in this chapter, no significant change in the one instrument approach procedure is anticipated nor is it anticipated that a separate approach procedure will be developed for the second runway.

Shifting the runways as recommended to create RSAs, OFAs and OFZs meeting FAA standards will shift the Part 77 surfaces an equal amount. Part 77 surfaces are not affected by displaced thresholds.

Runway Protection Zones

Runway protection zones are yet another type of airfield area for which the FAA has defined safety criteria. The function of RPZs is to enhance the protection of people and property on the ground by limiting the uses within RPZs. The runway protection zones for each runway end at Reid-Hillview Airport have the following dimensions:

- Length: 1,000 feet
- Width near runway end: 250 feet
- Width at outer end: 450 feet

For paved runways, runway protection zones begin 200 feet beyond each runway and are aligned along the extended runway centerline.

All four runway protection zones extend off of airport property. To the north, the runway protection zones overlay Ocala Road and the southern end of the adjacent park. To the south, the runway protection zones include a segment of Tully Road and the adjacent shopping center. Shifting the runways as recommended will shift the runway protection zones an identical amount. It is not feasible to acquire additional land or eliminate the nonaviation uses currently within the runway protection zones.

Building Restriction Line

The building restriction line defines those areas that are suitable for construction of terminals, hangars, and other airport structures. Building restriction lines are typically established such that a typical structure would not penetrate the FAR Part 77 surfaces. Other factors that are commonly considered include: air traffic control tower line-of-sight criteria and setbacks from navigational aids and taxiways.

The building restriction line on the east side of Reid-Hillview Airport has historically been set 40 feet from the apron edge taxiway (Taxiway Z). This provides 310 feet of separation from the centerline of Runway 13L-31R to the nearest structure. Although the 40-foot setback is somewhat less than the standard for ARC B-I (small) aircraft, it exceeds the setback required to accommodate the design aircraft (Beech King Air B100). No change is recommended.

On the west side of the airfield, the building restriction line has been set 250 feet from the centerline of Runway 13R-31L. Construction of the proposed south side parallel taxiway will not require an adjustment of the existing southern building restriction line. Therefore, no change is recommended.

OTHER AIRFIELD DESIGN ELEMENTS

Runway Lighting, Marking, and Visual Approach Aids

Runway 13L-31R is equipped with medium intensity runway lighting along the edge of the runway. Runway end identifier lights are also installed at each runway end. The second runway, Runway 13R-31L, does not have runway lights. No change is proposed.

Both runways have basic markings. All four runway ends have displaced threshold markings. No change in the location of displaced thresholds relative to the runway ends is recommended.

Runway 13L-31R has 2-box VASIs to guide landings to both runway ends. Runway 13R-31L has a 2-box VASI to guide landings to the 31L end of the runway. All three VASIs have 4.0 degree approach slope angles. The least used runway end, Runway 13R does not have a visual landing aid. No additional visual approach aids are proposed.

Hold lines

Hold lines are set 125 feet from the centerline of the adjacent runway. This meets the standard for runways serving small aircraft with visual or nonprecision approaches. The proposed west side parallel taxiway will also use a 125-foot setback for the hold lines.

Wind Indicators and Segmented Circle

A single wind cone is located between the runways near midfield. This wind cone is collocated with a segmented circle. The segmented circle contains the L-shaped brackets that indicate that there is left traffic to Runway 13L and right traffic to Runway 31R. No brackets indicate that there is left traffic to Runway 31L and right traffic to 31R. The intent is to indicate that only Runway 13L-31R is to be used when the tower is not in operation.

Taxiway System

Reid-Hillview Airport is served by two full-length parallel taxiways: Taxiway Z and Taxiway Y. Both taxiways are located on the east side of the airfield. Taxiway Z is an apron edge taxiway that runs the full length of the airfield. Five exit taxiways serve the two runways: Taxiways A, B, C, D, and E. Two additional taxiways (F and G) serve the FBO area. Fifteen taxilanes provide access to the tiedowns and hangars.

Construction of a new parallel taxiway on the west side of the airfield is proposed, primarily for aircraft that have landed on Runway 13R-31L and intend to takeoff again. Currently, aircraft landing on Runway 13R-31L must cross Runway 13L-31R in order to taxi back for takeoff. Adding a west side parallel taxiway would:

- Reduce the number of aircraft landing on Runway 13R-31L that must cross Runway 13L-31R, thereby reducing the risk of runway incursions.
- Reduce ground congestion, which in turn would reduce the need for extended traffic patterns during peak traffic periods as well as reduce the number of touch-and-gos.

The benefits of adding the west side parallel taxiway will be magnified once the Noise Compatibility Program (NCP) measures are implemented because the NCP designates Runway 31L as the primary landing runway. The FAA Air Traffic Control Tower (ATCT) chief also recommends the west side parallel taxiway.

A short extension of Taxiway Y to the north is also proposed. This additional taxiway segment would facilitate entering and leaving the FBO area and northern-based tiedowns. The existing helipads would be retained in their current locations and incorporated into the new west side parallel taxiway and Taxiway Y extension.

Run-up aprons are located at both ends of Runway 13L-31R. Additional holding aprons are located between the two runways at each end. Reconfiguring the run-up aprons at the northern end of the runways is recommended to increase wingtip clearances between aircraft bypassing aircraft conducting run-ups and thereby reduce the ground collision risk during peak use periods.

Chapter 4

Building Area Design

4

Building Area Design

Overview

The building area of an airport encompasses all of the airport property not devoted to runways, major taxiways, required clear areas, and other airfield-related functions. Among the facilities that are commonly found at general aviation airports are:

- Based aircraft tiedowns and hangars
- Transient aircraft parking
- Fixed base operations facilities
- Fuel storage and dispensing systems
- Access roads and automobile parking
- Security fencing and gates
- Lighting, marking, and signage
- Public rest rooms
- Public telephones
- Aircraft wash racks
- Nonaviation uses

Fixed Base Operation—A business that provides aviation services for general aviation aircraft.

Additional facilities are also common at busy general aviation airports such as Reid-Hillview:

- A terminal building with pilots' lounge.
- Air traffic control tower.
- Airport maintenance facilities.
- Aviation supporting facilities, such as a restaurant, hotel, and car rental agency.
- Commercial buildings and other nonaviation, revenue-producing uses.
- Public viewing area.

This chapter examines the factors that affect the siting and development of future building area facilities at Reid-Hillview Airport. The focus is on providing guidance on the use of available land on an airport severely constrained by limited land availability. The proposed facility design is shown on the building area plan found inside the back cover.

DESIGN FACTORS

- **Demand**—There is forecast to be demand for additional general aviation building area facilities over the 20-year planning period. Most of the demand will be for upgrading of the existing facilities. However, as documented in Chapter 2, Reid-Hillview's based aircraft population is forecast to increase by approximately 24 aircraft over the next two decades.

  The types of aircraft that will use the airport in the future are not expected to differ significantly from those currently using the airport. The mix will be dominated by single- and twin-engine piston aircraft. However, it is anticipated that the airport will see use by small turboprops and jets.

- **Setback Distances**—The interior boundary of the building area is determined in large part by the necessary setback distances from Runway 13L-31R, taxiways, and taxilanes. These setbacks are defined in Federal Aviation Administration regulations and guidelines. As discussed in the preceding chapter, the following design criteria are recommended:
  - A minimum of 310 feet from the centerline of Runway 13L-31R to buildings.
  - A minimum of 45 feet from taxiway centerlines to aircraft parking positions or buildings.
  - A minimum of 65 feet between facing hangars.

- **Existing Facilities**—All existing aviation-related structures, except the air traffic control tower, are located on the east side of the airport. Most of the east side is already developed. There is a strip of undeveloped land facing Capitol Expressway, and a small block at the intersection of Capitol Expressway and Tully Road. Except for those two areas, future development will largely consist of upgrading existing facilities or redevelopment of currently developed areas. Generally, the physical condition of existing structures is good.

- **Height Limitations**—The location of the runways relative to the building area makes it unlikely that Federal Aviation Regulations Part 77 airspace surfaces will significantly constrain construction in the future.

- **Accessibility**—An important design consideration is the ease of access to individual sections of the building area from both taxiways and public roads. The existence of a full-length parallel taxiway and full-length apron edge taxiway provides excellent circulation for aircraft. The shallow building area is well served by numerous taxilanes at right angles to the parallel taxiways.

  The current street layout provides direct access to the general aviation terminal and fixed base operators. Access to based aircraft storage hangars and the tiedown aprons is via gates located in the vicinity of the terminal.

PRINCIPAL BUILDING AREA FEATURES

Based Aircraft Storage and Parking (County-owned)

Hangars, Shelters and Tiedowns

Santa Clara County currently rents 145 hangars, 52 shelters and 190 tiedown spaces located on the public (i.e., County) aprons. Of the 190 tiedowns, 33 are located on the apron fronting the terminal. The balance are located in several rows intermixed with hangars for based aircraft.

Airport users have advocated for construction of additional hangars at RHV to bring the inventory of storage spaces in line with demand – high for hangars and lower for tiedowns. In addition, a number of the existing hangars have reached the end of their useful life and need replacement. Currently, a long waiting list for hangars exists while a small number of tiedowns remain vacant. Since hangars are ineligible for federal assistance under the Airport Improvement Program, the financial risks and rewards of building hangars would accrue solely to the County.

Therefore, the economics of constructing new hangars over existing tiedowns is just as important as physical constraints in the site planning process. For this reason, a specific reconfiguration of the County-owned aircraft storage spaces is not shown in the land use plan. A detailed economic analysis of building hangars over existing tiedowns is contained in the Business Plan.

In any event, increasing the ratio of hangars to tiedowns (by building hangars over existing tiedowns) within the County-owned aircraft storage area would not adversely impact the ability to remain within the maximum basing capacity limitation of 750 aircraft established for the airport since fewer hangars than tiedowns can be accommodated in any given area.

Transient Aircraft Parking

All public transient parking positions are located in a double line in front of the terminal. Presently 60 tiedown positions are marked on the terminal apron. Of these, there are currently 27 spaces designated for transient use. During weekdays, between 8 and 15 spaces are commonly used. On weekends, the number is higher; typically 15 to 20 spaces are used. Holiday peak use often exceeds available transient spaces and unused monthly tiedown spaces are used. Typical holiday peaks are about 30 aircraft.

There has been slow, but steady growth in the average number of transient tiedowns used. This trend is expected to continue. Based upon recent trends, weekday use is expected to grow faster than weekend use. For facility planning purposes, peak weekday use is forecast to grow from 15 to 30 over the next 20-years. Weekend peak use will grow from 20 to 30 spaces. Peak holiday use is forecast to grow from 30 to 45 spaces.

As noted above, there are currently 60 tiedown spaces, including both transient and based positions. There are sufficient spaces to accommodate future transient demand, and some based aircraft. As transient demand increases, based aircraft should be relocated to the tiedowns in the based aircraft hangar area.

Helicopter Parking

One public helicopter parking position is provided at Reid-Hillview Airport. It is located at the south end of the transient apron, near the airport maintenance building. The location is convenient to the terminal, while providing adequate separation from transient and based fixed-wing aircraft parking. One parking position is adequate given the current frequency of transient helicopter operations.

Fixed Base Operations Area

A bit over 18 acres at Reid-Hillview Airport have been leased to businesses that provide aviation-related services. These aviation businesses are termed fixed base operations (or fixed base operators). The seven fixed base operations (FBOs) taken together provide a full range of general aviation services. Several of the FBOs provide a number of services and could be considered to be *full-service* or *multi-service* FBOs. Others provide only one or two services and are referred to as *limited-service* or *specialty* FBOs.

Table 1B in Chapter 1 summarizes all of the services provided at Reid-Hillview Airport. Note: Two of the seven FBOs each hold two master leases for a total of nine master leases.

The leaseholds are served by two taxilanes that connect to the apron-edge taxiway. Each of the leaseholds faces directly onto a public street. Although the internal configuration of these leaseholds will likely change over the life of this plan, no significant changes to the layout or circulation patterns of the FBO area are required.

Given the constraints on airport development, the current acreage is judged to be adequate to serve the needs of aviation through the 20-year life of this plan. Consolidation of the leaseholds into blocks of 3 to 5 acres (after expiration of the existing master leases) would permit reconfiguration of the FBO facilities to produce more efficient layouts. Reconfiguration would also enable the FBOs to more readily serve both transient and based aircraft.

General Aviation Terminal

A two-story general aviation terminal is located slightly north of midfield on the east side of the airfield. The building currently contains a pilots' lounge, public restrooms and telephones, vending machines, and County airport management and operations offices. The second story is currently being renovated to house the equipment room for the proposed Aircraft Noise and Flight Track Monitoring System (ANFTMS) and to allow the staff offices to move upstairs.

The building is in good condition. With routine maintenance, the structure should continue to serve through the 20-year life of this plan. The floor area should prove adequate through the planning period.

SUPPORTING FACILITIES

Aircraft Fuel Storage and Dispensing

Current County practice is to issue fueling permits to FBOs who wish to sell fuel (and who meet the County's minimum standards

for fueling activities) rather than provide fueling services with County facilities and staff. Four of the FBOs currently provide fuel. Therefore, no site for a County fueling facility has been designated.

Wash Rack

Wash Rack—A facility for washing aircraft. It typically consists of a concrete pad provided with a hose bib. Wash water is collected and directed to a sewage treatment facility.

There is no "rack" associated with wash racks. Because cavalry officers where the first military pilots, the name for an aircraft washing facility was borrowed from horse washing facilities that sometimes do have racks.

One public-use wash rack is located south of the airport maintenance building. This location does not conflict with circulation on either the transient apron or the adjacent based tiedown rows. Therefore, this facility can remain in its present location.

Access and Auto Parking

Access to the east side building area is from Capitol Expressway via Cunningham Avenue. Cunningham Avenue leads directly to the terminal and associated parking lot. John Montgomery Drive and Swift Avenue branch off from Cunningham Avenue near the entrance to the airport. John Montgomery Drive extends to the north, initially paralleling Capitol Expressway, before curving to the west. A cul-de-sac, Robert Fowler Way, joins John Montgomery Drive near its midpoint. These roads provide access to all of the FBOs at Reid-Hillview Airport.

Swift Avenue leads south from its intersection with Cunningham Avenue. This road runs past the ball diamonds, wraps around the hangar area and connects with Tully Road. This road would provide access to the nonaviation commercial leaseholds that face Capitol Expressway and Tully Road.

No major changes in the on-airport road network appear necessary to efficiently accommodate demand through the life of this plan.

Public parking is available in the terminal parking lot and along the public streets on the airport. The L-shaped terminal parking lot contains 152 spaces. Based upon current patterns of use, the current amount of parking exceeds long-term demand. Some of the existing parking could be converted to other uses. In the long-term, the degree to which the FBOs serve transient aircraft will affect the demand for public parking. Automobile parking needs should be specifically addressed when FBO modify their facilities.

A light rail line is proposed to run along Capitol Expressway. The timing and exact configuration of the facility is not currently known. Current planning suggests that a light rail station will be in the immediate vicinity of the airport. The proposed light rail line would not negatively affect current or planned uses of the airport. Introduction of the line would offer an alternative means of accessing the airport.

Fencing, Gates and Security

Most of the airport perimeter is fenced with six-foot chain link fence. However, within the FBO area, many areas have either low fences or no fencing. The principal entrance to the airfield for based pilots is via an electronically controlled gate located adjacent to the terminal parking lot. A punch pad activates this gate.

Although the Transportation Security Agency has not yet adopted security regulations for general aviation airports, it is widely anticipated that the regulations will mandate both physical barriers (e.g., fencing and gates) and operational changes (both by the County and FBOs). County staff has already applied for Airport Improvement Program grants for:

- Improvements to the system of fencing and gates.
- Installation of additional security lighting.
- Development of a centrally-monitored closed circuit TV system
- Installation of motion detectors on the airfield.

NONAVIATION USES

Commercial Leases

In the previous phase of the master planning process dealing with forecasting demand for aircraft basing and selecting a role for each airport to meet the forecasted demand, the Board of Supervisors preliminarily approved the concept of leasing the undeveloped portion of the airport for compatible commercial uses to generate revenue:

- to fund operation and maintenance of the airport infrastructure including physical security enhancements;
- to fund projects that enhance the airport's compatibility with the surrounding community (including projects related to the Noise Compatibility Program);
- to reduce the Airport Enterprise Fund's reliance on aircraft storage revenue; and
- for other purposes determined to be appropriate and legally permissible.

Three areas have been identified that are potentially suitable for nonaviation commercial use:

- An 8.0 acre parcel at the intersection of Capitol Expressway and Tully Road.
- A 3.0 acre parcel fronting Swift Lane
- A 5.3 acre parcel that includes the ball fields and a portion of the terminal parking lot

Given the above parcels' proximity to the airfield, it will be important to ensure that any proposed development and use of the parcels is compatible with the airfield with respect to the FAR Part 77 imaginary surfaces[1] and with respect to the safety zones established in the Comprehensive Land Use Plan adopted by the Airport Land Use Commission. Guidance contained in the C*alifornia Airport Land Use Handbook* may be of value in evaluating proposed uses.

The third parcel listed above occupies a central location on the airport. Conversion of this parcel to a nonaviation commercial use requires relocating the three existing ball fields. Given the urbanized location of Reid-Hillview Airport, it is not surprising that there are no vacant off-airport sites in the immediate vicinity. Therefore, this plan proposes to create three ball fields on the west side of the airfield. The site is located adjacent to an existing boys and girls club. Since the unlighted ball fields would have adequate lateral separation from Runway 13R-31L as well as from the proposed new parallel taxiway, conflicts with aviation activities are not anticipated.

It should also be noted that the Valley Transportation Authority (VTA) currently plans to construct a light rail line in the Capitol Expressway corridor. Although design of the light rail line has not yet been finalized, it appears that the project will not present a significant impact to the airport property. As of this writing, a station is planned between Cunningham Avenue and Ocala Avenue adjacent to the northeast airport boundary. The light rail project may require the utility towers located between John Montgomery Drive and Capitol Expressway to be relocated to the east side of Capitol Expressway, but it appears unlikely that their current location will be developed as a park-and-ride lot or train car storage area.

[1] The FAR Part 77 imaginary surfaces are discussed in more detail in Chapter 3, Airfield Design.

Chapter 5

Business Plan

5

RHV Business Plan

INTRODUCTION

Just as previous chapters have outlined plans for the airport's physical development, this chapter outlines a plan for the airport's financial development. More specifically, this chapter will:

- Present an overview and analysis of the Airport Enterprise Fund (AEF) and the airport's finances;
- Identify the capital projects and local funding required to implement the portions of the Master Plan and the Noise Compatibility Program that are not eligible for FAA funding;
- Discuss potential sources of new revenue, including leasing the parcels identified in the Building Area Design chapter for non-aviation commercial uses; and
- Recommend a leasing strategy for various airport properties.

AIRPORT ENTERPRISE FUND OVERVIEW

Master Plan Guiding Principles

At the beginning of the planning process, the Board adopted principles to guide the development of the Master Plan. These Guiding Principles include the following:

> *"The Airport Enterprise Fund should be self-sustaining without subsidy from the General Fund. Revenue from fees and charges, state and federal grants and other sources should be sufficient to fund operating and maintenance costs, capital improvements and an appropriate level of reserves."*

Since the creation of the Roads & Airports Department, the AEF has generated sufficient operating revenue to fund operating expenses. Capital projects have been funded on a pay-as-you-go basis using primarily federal and state grants, the one notable exception being the South County Airport Hangar Project, which was ineligible for grant funding and was therefore bond-funded. Therefore, the AEF has been self-sustaining financially even prior to the Board's formal adoption of such a principle. Even in the unusual case that occurred in the early 1990s where the County bought out two RHV leaseholders in order to settle litigation brought by the lessees and the General Fund made loans to the AEF to fund the buyouts, the airport generated sufficient revenue from the acquired leasehold assets to pay back the loans with interest.

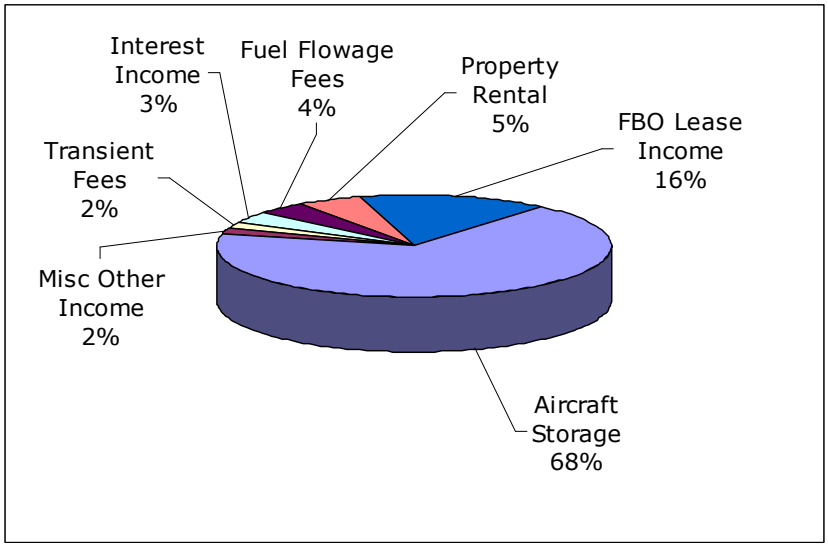


Figure 5A: Airport Enterprise Fund Revenue

AEF Revenues

Total annual AEF revenue is approximately $2.6 million. Figure 5A above presents the AEF revenue categories and shows that 68% of AEF operating revenue is generated from County-owned aircraft storage spaces (i.e. hangars, shelters and tiedowns). Although demand for aircraft storage is projected to remain strong in the foreseeable future, the AEF's reliance on this revenue source makes it vulnerable to downturns in the general aviation market.

The next largest revenue component (16%) is lease revenue from the Fixed Base Operators (FBO). The FBO leases specify an annual ground rent of 8.5% of the fee simple value of the leasehold premises (not including improvements) and provide for periodic adjustments pursuant to a reappraisal of the premises. Given the

long-term nature of the FBO leases, the revenue from this source is essentially fixed aside from the occasional minor adjustment to the lease rate (the reappraisal completed in December 2004 resulted in no rate increase).

All other revenue categories including property rental, fuel flowage fees, transient aircraft fees and interest income collectively generate only 16% of AEF revenues.

AEF Expenditures

Figure 5B below presents the AEF expenditure categories and shows that 45% of AEF expenditures are staffing costs (salaries and benefits). Services and supplies account for 34% of AEF expenditures, while the local funding component of capital projects represents 6% of AEF expenditures. Debt service on bonds issued to fund the South County Airport Hangar project and to retire the General Fund loans mentioned above makes up 11% of AEF expenditures.

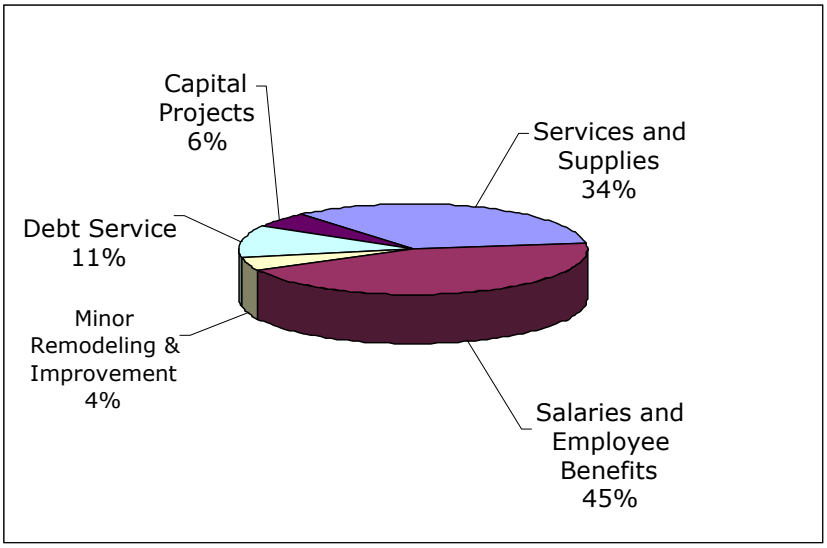


Figure 5B: Airport Enterprise Fund Expenditures

Retained Earnings

Cash flow from revenues and expenditures generally is not uniform and predictable. The AEF Fund Balance (called "Retained Earnings" since the AEF is an enterprise fund) dampens the effect of the irregular cash flow. The unencumbered portion of the Retained Earnings balance represents the AEF's "rainy day" fund and is a measure of the AEF's financial health.

The projected AEF unencumbered Retained Earnings balance as of the end of FY 2005 is $1,700,000. A level of unencumbered Re-

tained Earnings equal to at least one year's operating expenses is advisable. Upon completion of the South County Airport Hangar Project, the AEF will be in a position to begin increasing the level of Retained Earnings.

Long-term Debt

The AEF carries $6,115,000 in long-term bond debt (projected as of June 30, 2005) of which $5,576,000 is attributable to the South County Airport Hangar project and $539,000 is attributable to the refinancing of the General Fund loans discussed above. The current long-term debt level is approximately 1.9 times annual revenue and 3.6 times the level of unencumbered Retained Earnings.

REID-HILLVIEW AIRPORT REVENUE AND EXPENDITURES

Although the AEF captures all airport finances in a single budget unit, the revenue and expenses associated with each of the three airports are tabulated for internal management accounting purposes. Revenue and expenses directly attributable to each airport such as FBO lease revenue, aircraft storage space rental revenue, operations staff salaries, etc. are easily identified. General and administrative expenses not attributable directly to an individual airport (insurance, management staff salaries, etc.) are captured in an expense pool and allocated to each airport based on a weighted formula that uses cost drivers such as the number of based aircraft, number of aircraft operations and number of major facilities.

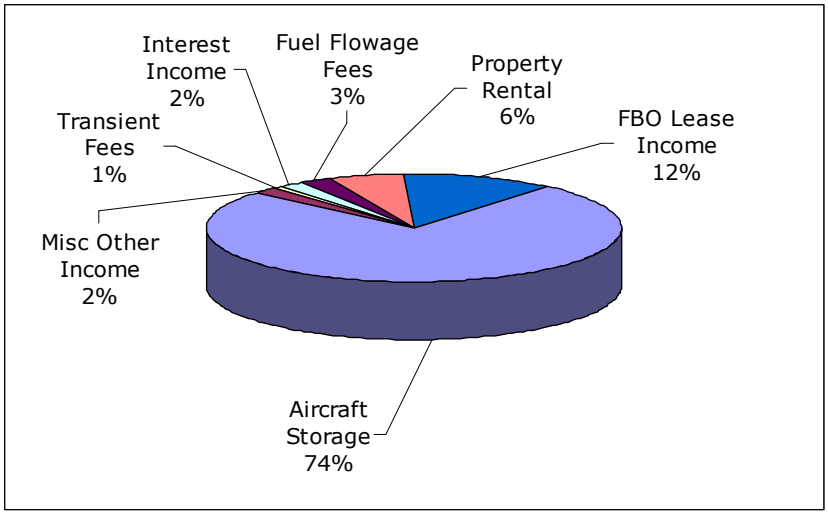


Figure 5C: Reid-Hillview Airport Revenue

RHV revenue is shown in Figure 5C. The airport generates approximately 56% of the total AEF revenue - far more than the other two airports, primarily due to the income from the 145 County-owned hangars. Prior to the South County Airport Hangar Project it was the only one of the three airports to have County-owned hangars.

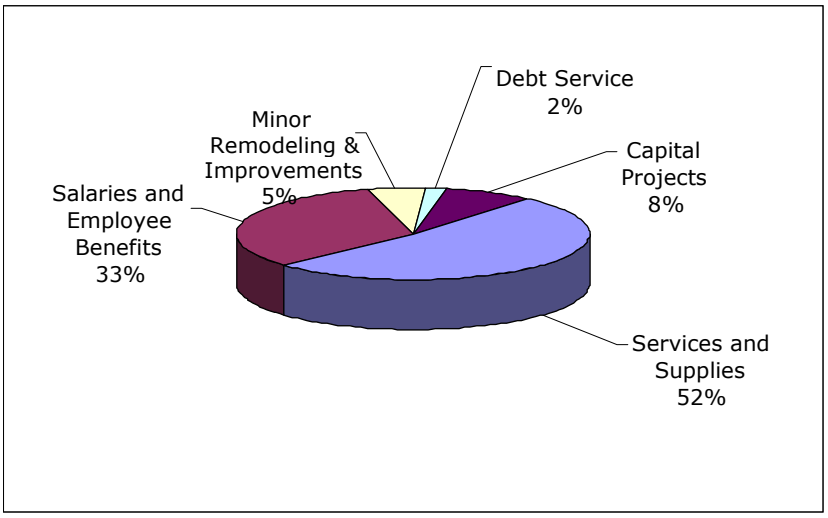


Figure 5D: Reid-Hillview Airport Expenditures

Expenditures are shown in Figure 5D. With the addition of the Noise Abatement Program Coordinator position, the airports division is now at full staffing and additional staff positions at RHV are not anticipated.

Historically, RHV revenue has exceeded expenditures and the surplus has been used to subsidize operations at Palo Alto Airport (PAO) and South County Airport (E16). The result has been that the AEF has not been able to accumulate sufficient funding for infrastructure maintenance, repair and replacement projects at RHV. The airport currently has a large backlog of these types of projects, which are discussed below in greater detail. However, even if all operating revenue stayed at RHV it would still not be sufficient to fund all of the projects ineligible for FAA funding. Therefore, additional funding sources will be required in order to fund these projects.

AIRPORT CAPITAL IMPROVEMENT PLAN (ACIP)

FAA Airport Improvement Program - Funded Capital Projects

All projects identified in Chapter 3, Airfield Design, as well as airfield-related repair projects are eligible for FAA funding under the Airport Improvement Program (AIP). Currently, AIP-eligible projects approved by the FAA receive 95% federal funding and are also eligible for an additional 2.5% state match, subject to availability of funds. Therefore, the local match required for AIP projects can be as low as 2.5%. However, the federal percentage is subject to change whenever the AIP is periodically reauthorized. Previously, the AIP provided 90% funding and there is the possibility that the program may revert to this funding level when next reauthorized.

A small number of AIP-eligible projects are also contained in Chapter 4, Building Area Design. These projects are primarily related to physical security.

The approved Noise Compatibility Program (NCP) also contains a number of AIP-eligible projects. Since AIP-eligible projects are identified in Chapters 3 and 4 and in the NCP, a discussion of these projects will not be repeated here.

Locally - Funded Capital Projects

This section will discuss the funding requirements for projects that are not eligible for AIP funding and therefore must be funded entirely with local funds. These projects fall into two groups: Projects identified in the NCP that are not eligible for AIP funding and major infrastructure repair projects that are not eligible for AIP funding.

The NCP identified 33 measures designed to reduce the impact of airport noise on the surrounding community. Some of the measures require only staff time to implement. Other measures such as installation of a Aircraft Noise and Flight Track Monitoring System (ANFTMS) and soundproofing of homes within the 65 dB CNEL contour require substantial funding but are eligible for AIP funding. Other measures such as soundproofing of homes not within the 65dB CNEL contour are not eligible for AIP funding and must be funded locally.

As discussed above, RHV's utility and building infrastructure has a significant level of deferred maintenance and repair. To correct these deficiencies and bring RHV's infrastructure and maintenance program up to current standards, projects are required to replace obsolete electrical utility systems; replace and install landscaping in

public areas and on the airport perimeter; rehabilitate the Terminal Building and reconfigure the Terminal Building parking lot; relocate electrical utility systems underground; procure mowers, tractors and apron/airfield sweepers; refurbish and paint existing County-owned hangars; and locate and map utility systems and other infrastructure.

It will be necessary to phase both the NCP and infrastructure-related projects over the life of the Master Plan in order to pursue a "pay-as-you-go" strategy. Adopting such a strategy is a prudent business practice since it consistently matches expenditures with available revenue and precludes the need to assume additional debt.

POTENTIAL SOURCES OF ADDITIONAL REVENUE

This section examines two potential sources of additional revenue: The lease of three parcels identified in Chapter 4 for non-aviation commercial uses and reconfiguration of the County-owned aircraft storage area. Each of these potential sources of additional revenue is discussed below.

Non-Aviation Commercial Leases

In the previous phases of the master planning process related to selecting a role for each airport to meet the forecasted demand (Chapter 2) and developing a site plan for the airfield and building areas (Chapters 3 and 4), the Board preliminarily approved the concept of leasing the undeveloped portion of the airport for compatible commercial uses to generate revenue:

- to fund operation and maintenance of the airport infrastructure including physical security enhancements;
- to fund projects that enhance the airport's compatibility with the surrounding community (including projects related to the Noise Compatibility Program);
- to reduce the Airport Enterprise Fund's reliance on aircraft storage revenue; and
- for other purposes determined to be appropriate and legally permissible.

The concept of leasing undeveloped property at the airport is also a Board-approved recommendation of the Harvey Rose management audit of the airports conducted in 1999. The audit report states that non-aviation commercial development "is a sound direction for the Department to take. It would provide a new source

of revenue for the [Airport Enterprise] Fund without increasing air traffic and it would diversify and stabilize the [Airport] Division's revenue sources in the event of a downturn in the general aviation market."

Chapter 4 identified three parcels at RHV for conversion to non-aviation commercial uses:

1. An 8.0-acre parcel located at the corner of Capitol Expressway and Tully Road.
2. A 5.3-acre parcel located at the intersection of Cunningham Avenue and Swift Avenue (assuming the ball fields are relocated to the other side of the airport).
3. A 2.5-acre parcel located on Swift Avenue.

The AEF could realize a total of approximately $950,000 annually in ground lease revenue (in current dollars) from these three parcels. The estimated annual lease revenue is based on the expected market rate of return multiplied by the parcels' appraised value. The appraised value is based on a highest and best use as retail development. The estimated annual lease revenue reflects market conditions as of late 2004 and is therefore subject to change.

It is important to note that the County General Fund may be entitled to some or all of the lease revenue from these parcels. Since approximately one-half the total cost of the airport's original real property acquisition was funded by the General Fund and the undeveloped parcels have never been used for aviation-related purposes, the General Fund may have a legitimate claim with respect to ownership of the parcels and the revenue generated from their development for non-aviation commercial uses. Absent legal impediments, the Board may elect to establish new guidance relating to this revenue to allow increased flexibility with respect to its uses.

Economic Analysis of Constructing Hangars Over Existing Tiedowns

As shown above in the AEF overview, the primary component of airport operating revenue is the rental of County-owned aircraft storage spaces. Aside from annual CPI-based increases in rental rates, the total revenue from this source is obviously limited by the number of storage spaces. Given that the size of the County-owned aircraft storage area is fixed and the airport's basing capacity is limited to 750 as outlined in Chapter 2, Roles & Forecasts, the very limited opportunity that exists to increase revenue from this source lies in the possibility of reconfiguring the existing mix of hangars, shelters and tiedowns.

Because the economics of constructing new hangars over existing tiedowns is just as important as physical constraints in the site planning process, Chapter 4, Building Area Design, did not show a specific reconfiguration of the County-owned aircraft storage area. Instead, a discussion of the economics of building hangars over existing tiedowns was deferred to the Business Plan.

Generally speaking, constructing hangars over undeveloped property that is not currently generating revenue is financially attractive at Bay Area airports despite high construction costs due to the high demand for hangars. However, construction costs - which rose 10.5% overall in 2004 and even higher on certain materials such as steel and concrete – are rising much faster than hangar rates. The total cost of a hangar construction project today would be in the neighborhood of $55/SF. The current environment of steeply rising construction costs coupled with rising interest rates is reducing the economic attractiveness of building new hangars.

The negative effects of high construction costs and rising interest rates are amplified in a situation where an airport is considering constructing hangars over existing tiedowns because the tiedowns that would be eliminated generate about one-quarter the revenue of hangars with no additional capital investment required. Once debt service, hangar maintenance costs and the loss of tiedown revenue are accounted for, building hangars over tiedowns is far less attractive financially than building hangars on undeveloped property that currently is not generating revenue (such as the South County Airport hangar project). In fact, the break even point is at a relatively low interest rate of 7.5%.

If new hangar construction were to be financed through borrowing, a significant issue to consider is the appropriate level of overall financial risk – in the form of a debt ceiling – to be assumed by the AEF. The AEF is currently carrying over $6,000,000 in long-term debt as previously discussed, which is nearly twice the AEF's annual revenue. Assuming additional debt is not recommended until the Retained Earnings balance is increased.

The AEF debt ceiling issue is directly related to the Board-adopted principle that the AEF should be financially self-sustaining without General Fund support. This principle is especially important given the existing demands on the General Fund and makes it imperative to ensure that the General Fund will not be required at any time in the future to step in and subsidize the AEF. Although the County internally accounts for debt incurred by the airports under the AEF, the County as a whole is the legal entity responsible for the AEF bond debt and would be required to make the debt payments if the AEF itself were unable to do so.

The other financing option would be to accrue revenue from the non-aviation commercial leases and build hangars on a pay-as-you-go basis. This method would be preferable because it avoids the financial risks associated with taking on additional debt. However, it may be some time before the undeveloped parcels are leased and begin to generate revenue; moreover, there will be many competing demands on that revenue as discussed above. Therefore, it appears that hangar construction over tiedowns – whether financed by borrowing or on a "pay-as-you-go" basis - will probably not occur within the foreseeable future.

LEASING STRATEGY

This section discusses recommended leasing strategies for various airport properties. While not a comprehensive analysis, this section does address broad overall approaches and major issues to be considered with respect to leasing the:

1. Non-aviation Commercial Parcels
2. Existing FBO leaseholds
3. Swift Avenue Building
4. Terminal Building Restaurant

Non-Aviation Commercial Parcels

It is essential that the future development of these parcels be compatible with the operation of the airport. It is also essential that the future developments be unrelated to (and therefore independent of) the operation of the airport. The next most important criterion is the creditworthiness of the lessee(s). Provided these baseline criteria are met, each parcel should be leased to the prospective lessee offering the best financial terms.

In order to generate the maximum revenue consistent with the above criteria, it is recommended that the marketplace be allowed to determine the parcels' highest and best use through the Request For Proposal (RFP) process.

A fundamental determination as to the respective roles of the County and the City of San Jose in the land development process, including activities related to the California Environmental Quality Act (CEQA), will be required in order to develop an appropriate leasing process that includes ample opportunity for community input. Although such a determination is beyond the scope of this document, it is important to note that both the County's and the

City's established land development processes are designed to ensure that public input is received and considered.

Existing FBO Leaseholds

There are nine FBO leaseholds at RHV. With 687 based aircraft at RHV, the number of based aircraft per FBO is 76 to 1. This ratio is far lower than 10 other general aviation airports in Northern California with 200 or more based aircraft (see Table 5A).

Ratio of FBOs to Based Aircraft at Northern California Airports

AIRPORT	BASED AIRCRAFT	FBOs	RATIO OF BASED AIRCRAFT TO FBOs
RHV	**687**	**9**	**1 : 76**
Charles M. Schulz - Sonoma County Airport	380	1	1 : 380
Sacramento Executive Airport	365	1	1 : 365
Watsonville Municipal Airport	331	1	1 : 331
Livermore Municipal Airport	604	2	1 : 302
Gnoss Field Airport [Novato]	301	1	1 : 301
Buchanan Field Airport	591	2	1 : 296
Palo Alto Airport	524	2	1 : 262
San Carlos Airport	503	2	1 : 252
Hayward Executive Airport	444	2	1 : 222
South County Airport*	207	1	1 : 207

* Includes 107 based aircraft and 100 (future) new hangar occupants.

Table 5A: Ratio of FBOs to Based Aircraft

Between the end of 2015 and 2019, eight of the nine RHV FBO leases will expire. The ninth FBO lease expires in 2023. It may be advisable to consolidate the nine leasehold premises; under current conditions between two and four FBOs would most likely be sufficient to provide based aircraft with an adequate range of high-quality services at an adequate level of competition. A market study should be conducted as the lease expirations approach to determine the optimal number of leaseholders. A determination as to the appropriate lease terms (e.g. length of lease(s) to be offered, buyout provisions, etc.) can also be made at that time.

Swift Avenue Building

The Swift Avenue building was acquired by the County in the early 1990s as part of a settlement to litigation brought by the lessee. Most of the building's approximately 10,600 gross square feet are occupied by a total of five different lessees. All leases are on a month-to-month basis and currently generate a total of approximately $77,000 in revenue annually. To generate higher lease revenue and reduce the administrative burden and cost of managing multiple small leases, leasing the entire facility to a single user for a longer term is recommended. The future tenant would be required

to lease the building "as is" and would be responsible for all tenant improvements.

A lease term of 10 years should be sufficient to attract potential lessees willing to invest in tenant improvements. If it is desired to retain flexibility regarding the use of the property during the lease term, a lease buyout provision could be included in the lease. To establish such a provision, potential lessees would be required, as part of the proposals submitted in response to the Request For Proposals (RFP), to include an up-front schedule of buyout costs that would show the fixed amount to be paid by the County in the event the County were to terminate the lease for any reason during any given year of the lease term. The proposed buyout costs would be considered in conjunction with all other terms of the proposal as part of the competitive evaluation process and become a binding term of the eventual lease with the successful proposer.

If attempts to lease the facility to a single user are unsuccessful, another option would be to include the building in the offering for the adjacent 2.5-acre parcel. This approach may improve the marketability of the 2.5-acre parcel in addition to eliminating the administrative burden and cost of managing the Swift Ave. building. It would also preclude the need to determine the appropriate lease length and buyout provisions since the lease for the 2.5-acre parcel would be independent of the airport operations.

Terminal Building Restaurant

The second-floor restaurant space located in the Terminal Building has been closed for approximately 15 years. Potential net revenue from the Terminal Building restaurant is not anticipated to be significant due to the costs of preparing the space for "standard shell delivery" (i.e. ready for the lessee to install all floor, ceiling and wall finishes as well as equipment and furnishings), which is estimated to be at least $150,000. If the County prepares the space for standard shell delivery it could expect lease payments in the neighborhood of $20,000 annually. If the space is leased in its current condition, the lessee would be responsible for the cost of preparing the space, which would result in lower lease payments to the County. In either case, net lease revenue from the Terminal Building restaurant will not contribute significantly to RHV's revenue stream during the foreseeable future. Therefore, a decision to lease the space for restaurant purposes would be based primarily on a desire to provide a convenience to airport users rather than for the purpose of generating income for the AEF.

In addition to the initial capital investment required, the potential for competing food service establishments to appear nearby on the non-aviation commercial leaseholds poses additional risk to poten-

tial lessees that may hinder the County's ability to lease the facility. Therefore, the preferred option for providing a restaurant amenity on the airport may be to simply allow a restaurant use in the lease of one or more of the non-aviation commercial parcels. As in the case of the Swift Avenue building discussed above, this would also preclude the need to determine the appropriate lease length and buyout provisions since the leases for the non-aviation commercial parcels would be independent of the airport operations.

SUMMARY

- The AEF has been financially self-sustaining since at least the inception of the Roads & Airports Department. Operating revenue has been sufficient to fund operating expenses including the local match required for grant-funded capital projects, which have been implemented on a pay-as-you-go basis.
- Approximately three-quarters of AEF operating revenue is derived from the rental of County-owned aircraft storage spaces, which makes the AEF vulnerable to fluctuations in the general aviation market. Most other components of AEF revenue such as FBO lease revenue and fuel flowage fees present little opportunity for growth.
- RHV has historically generated a surplus that has been used to subsidize operations at the other two County airports, which has prevented the accumulation of funding to reinvest in the airport infrastructure.
- Additional revenue sources are required to fund NCP and infrastructure projects not eligible for FAA funding.
- Building hangars over tiedowns is not likely in the foreseeable future due to its inherent economics and poor financing options.
- Leasing the airport's undeveloped parcels for non-aviation commercial uses has the potential to generate approximately $950,000 in revenue annually, however some or all of this revenue may not be available for airport purposes.
- The AEF should not assume additional long-term debt. All capital projects should be funded on a "pay-as-you-go" basis.
- The unencumbered Retained Earnings balance should be increased to the equivalent of one year of operating expenses.
- The nine FBO leaseholds should be consolidated into a fewer number upon expiration of the current master leases.

- The Swift Avenue Building should be re-leased to a single tenant or included in the lease for the adjacent 2.5 acre parcel to eliminate the administrative burden and costs of managing multiple small leases.
- A restaurant use should be allowed in the leases of the non-aviation commercial parcels.

Appendices

COMPATIBILITY PLANNING

Compatibility Concerns

Ensuring the maximum level of compatibility between an airport and surrounding land uses is essential. The land use compatibility concerns for airports fall into four functional categories. These categories are:

- Noise: Generally, defined by cumulative noise exposure contours describing noise from aircraft operations near an airport.
- Overflight: The impacts of routine aircraft flight over a community.
- Safety: From the perspective of minimizing the risks of aircraft accidents beyond the runway environment.
- Airspace Protection: Accomplished by limits on the height of structures and other objects in the airport vicinity and restrictions on other uses which potentially pose hazards to flight.

For each compatibility category, four features are outlined below:

- Compatibility Objective: The objective to be sought by establishment and implementation of the compatibility policies;
- Measurement: The scale on which attainment of the objectives can be measured;
- Compatibility Strategies: The types of strategies which, when formulated as compatibility policies, can be used to accomplish the objectives; and
- Basis for Setting Criteria: The factors which should be considered in setting the respective compatibility criteria.

Noise

Noise is one of the most basic airport land use compatibility concerns. Moreover, at major airline airports, many busy general aviation airports, and most military airfields, noise is usually the most geographically extensive form of airport impact.

- **Compatibility Objective** — The clear objective of noise compatibility criteria is to minimize the number of people exposed to frequent and/or high levels of airport noise capable of disrupting noise-sensitive activities.
- **Measurement** — For the purposes of airport land use compatibility planning, noise generated by the operation of aircraft to, from, and around an airport is primarily measured in terms of the cumulative noise levels of all aircraft operations. In California, the cumulative noise level metric established by state regulations, including for airport noise, is the Community Noise Equivalent Level (CNEL). This metric provides a single

measure of the average sound level in decibels (dB) to which any point near an airport is exposed. To reflect an assumed greater community sensitivity to nighttime and evening noise, events during these periods are counted as being louder than actually measured. Cumulative noise levels are usually illustrated on airport area maps as contour lines connecting points of equal noise exposure. Mapped noise contours primarily show areas of significant noise exposures—ones affected by high concentrations of aircraft takeoffs and landings. Noise contours for the current, and five- and twenty-year forecast activity levels were presented earlier in this chapter.

- **Compatibility Strategies** — The basic strategy for achieving noise compatibility in an airport vicinity is to limit development of land uses which are particularly sensitive to noise. The most acceptable land uses are ones which either involve few people (such as most forms of agriculture) or generate significant noise levels themselves (such as other transportation facilities or some industrial uses). Where historical development makes this infeasible (as at Reid-Hillview), noise insulation of the most effective means of reducing noise impacts.

- **Basis for Setting Criteria** — Compatibility criteria related to cumulative noise levels are well-established in federal and state laws and regulations. The basic state and federal criterion sets a CNEL of 65 dB as the maximum noise level normally compatible with urban residential land uses.

Overflight

Experience at many airports has shown that noise-related concerns do not stop at the boundary of the outermost mapped CNEL contour. Many people are sensitive to the frequent presence of aircraft overhead even at noise low levels. These reactions can mostly be expressed in the form of *annoyance*.

At many airports, complaints often come from locations beyond any of the defined noise contours. Areas that underlie common flight patterns are likely places for this to occur. The basis for such complaints may be a desire and expectation that outside noise sources not be intrusive—or, in some circumstances, even distinctly audible—above background noise levels.

While these impacts may be important community concerns, the question of importance here is whether any land use planning actions can or should be taken to mitigate the impacts or otherwise address the concerns. There is typically little that can be done to modify the pattern of air traffic close to the airport; FAA procedures dictate their location. Funding for noise insulation outside of the 65 CNEL contour is commonly not available. Even if it was, the concern would not address annoyance when residents are outdoors

These limitations notwithstanding, there are steps which ALUCs can and should take to help minimize overflight impacts.

- **Compatibility Objective** — In an idealistic sense, the compatibility objective with respect to overflight is the same as for noise: avoid land use development which can lead to annoyance and complaints. However, given the extensive geographic area over which the impacts occur, this objective is unrealistic except in rural areas and relatively close to

the airport. A more realistic objective therefore might be to promote conditions under which annoyance will be minimized. Possible strategies in this regard are described below.

- **Measurement** — Determining where to draw boundaries around areas of potentially significant overflight noise exposure is difficult because these locations extend beyond the well-defined CNEL contours. The general locations over which aircraft regularly fly as they approach and depart an airport are thus a better indicator of overflight annoyance concerns. For general aviation airports, such locations include areas beneath the standard airport traffic patterns, the portions of the pattern entry and departure routes flown at normal traffic pattern altitude, and perhaps additional places which experience a high concentration of overflights. Also, at all types of airports, common IFR arrival and departure routes can produce overflight concerns, sometimes many miles from the airport.

- **Compatibility Strategies**—As noted above, the ideal land use compatibility strategy with respect to overflight annoyance is to avoid development of residential and other noise-sensitive uses in the affected locations. To the extent that this approach is not practical, three different (but not mutually exclusive) strategies are apparent.
  - One strategy is to help people with above-average sensitivity to aircraft overflights—people who are highly *annoyed* by overflights—to avoid living in locations where frequent overflights occur. This strategy involves making people more aware of an airport's proximity and its current and potential aircraft noise impacts on the community before they move to the area. This can be accomplished through buyer awareness measures such as dedication of avigation or overflight easements, recorded deed notices, and/or real estate disclosure statements. In new residential developments, posting of signs in the real estate sales office and/or at key locations in the subdivision itself can be further means of alerting the initial purchasers about the impacts (signs are of little long-term value, however).
  - A second strategy is to minimize annoyance by reducing the intrusiveness of aircraft noise above normal background noise levels. In this regard, multi-family residences—because they tend to have comparatively little outdoor living areas, fewer external walls through which aircraft noise can intrude, and relatively high noise levels of their own—are preferable to single-family dwellings. To the limited extent that new residential development occurs in the vicinity of Reid-Hillview Airport, multi-family units would be desirable, except near the runway ends.
  - Finally, Santa Clara County is developing a voluntary program to financially aid aircraft owners willing to add mufflers to their aircraft.

- **Basis for Setting Criteria**—The basis for setting criteria is primarily the experience and knowledge that airport proprietors and airport land use commissions have about the noise sensitivity of the specific communities involved. This information can come from Part 150 Noise Management Programs, noise complaints, or other interactions with area residents.

Safety

Compared to noise, safety is in many respects a more difficult concern to address in airport land use compatibility policies. A major reason for this difference is that safety policies address uncertain events which *may occur* with *occasional* aircraft operations, whereas noise policies deal with known, more or less predictable events which *do occur* with *every* aircraft operation. Because aircraft accidents rarely happen and the time, place, and consequences of their occurrence cannot be predicted, the concept of *risk* is central to the assessment of safety compatibility. From the standpoint of land use planning, two variables determine the degree of risk posed by potential aircraft accidents:

- *Accident Frequency:* Where and when aircraft accidents occur in the vicinity of an airport; and
- *Accident Consequences:* Land uses and land use characteristics which affect the severity of an accident when one occurs.

- **Compatibility Objective**—The overall objective of safety compatibility criteria is simply to minimize the risks associated with potential aircraft accidents. There are two components to this objective, however:
  - *Safety on the Ground:* The most fundamental safety compatibility component is to provide for the safety of people and property on the ground in the event of an aircraft accident near an airport.
  - *Safety for Aircraft Occupants:* The other important component is to enhance the chances of survival of the occupants of an aircraft involved in an accident which takes place beyond the immediate runway environment.

- **Measurement**—In measuring the degree of safety concerns around an airport, the frequency component of risk assessment is most important: what is the potential for an accident to occur? As mentioned above, there are both *where* and *when* variables to the frequency equation:
  - *Spatial Element:* The spatial element describes *where* aircraft accidents can be expected to occur. Of all the accidents which occur in the vicinity of airports, what percentages occur in any given location?
  - *Time Element:* The time element adds a *when* variable to the assessment of accident frequency. In any given location around a particular airport, what is the chance that an accident will occur in a specified period of time?

- **Compatibility Strategies**—Safety compatibility strategies focus on the *consequences* component of risk assessment. Basically, the question is: what land use planning measures can be taken to reduce the severity of an aircraft accident if one occurs in a particular location near an airport? Although there is a significant overlap, specific strategies must consider both components of the safety compatibility objective: protecting people and property on the ground; and enhancing safety for aircraft occupants. In each case, the primary strategy is to limit the intensity of use (the number of people concentrated on the site) in locations most susceptible to an off-airport aircraft accident. This is accomplished by:

- *Density and Intensity Limitations:* Establishment of criteria limiting the maximum number of dwellings or people in areas close to the airport is the most direct method of reducing the potential severity of an aircraft accident.
- *Open Land Requirements:* Creation of requirements for open land near an airport addresses the objective of enhancing safety for the occupants of an aircraft forced to make an emergency landing away from a runway.
- *Highly Risk-Sensitive Uses:* Certain critical types of land uses—particularly schools, hospitals, and other uses in which the mobility of occupants is effectively limited—should be avoided near the ends of runways regardless of the number of people involved. Aboveground storage of large quantities of highly flammable or hazardous materials also should be avoided near airports.

- **Basis for Setting Criteria**—Setting safety compatibility criteria presents the fundamental question of what is safe. Expressed in another way: what is an *acceptable risk*? In one respect, it may seem ideal to reduce risks to a minimum by prohibiting most types of land use development from areas near airports. However, there are usually costs associated with such high degrees of restrictiveness. In practice, safety criteria are set on a progressive scale with the greatest restrictions established in locations with the greatest potential for aircraft accidents.

Airspace Protection

Relatively few aircraft accidents are caused by land use conditions which are hazards to flight. The potential exists, however, and protecting against it is essential to airport land use safety compatibility.

- **Compatibility Objective**—Because airspace protection is in effect a safety factor, its objective can likewise be thought of in terms of risk. Specifically, the objective is to avoid development of land use conditions which, by posing hazards to flight, can increase the risk of an accident occurring. The particular hazards of concern are:
  - Airspace obstructions;
  - Wildlife hazards, particularly bird strikes; and
  - Land use characteristics which pose other potential hazards to flight by creating visual or electronic interference with air navigation.

- **Measurement**—The measurement of requirements for airspace protection around an airport is a function of several variables including: the dimensions and layout of the runway system; the type of operating procedures established for the airport; and, indirectly, the performance capabilities of aircraft operated at the airport.
  - *Airspace Obstructions:* Whether a particular object constitutes an airspace obstruction depends upon the height of the object relative to the runway elevation and its proximity to the airport. The acceptable height of objects near an airport is most commonly determined by application of standards set forth in Part 77 of the Federal Aviation Regulations. These regulations establish a three-dimensional space in the air

above an airport. Any object which penetrates this volume of airspace is considered to be an obstruction and may affect the aeronautical use of the airspace.

- *Wildlife and Other Hazards to Flight:* The significance of other potential hazards to flight is principally measured in terms of the hazards' specific characteristics and their distance from the airport and/or its normal traffic patterns.

- **Compatibility Strategies**—Compatibility strategies for the protection of airport airspace are relatively simple and are directly associated with the individual types of hazards:
  - *Airspace Obstructions:* Buildings, antennas, other types of structures, and trees should be limited in height so as not to pose a potential hazard to flight.
  - *Wildlife and Other Hazards to Flight*: Land uses which may create other types of hazards to flight near an airport should be avoided or modified so as not to include the offending characteristic.

- **Basis for Setting Criteria**—The criteria for determining airspace obstructions and other hazards to flight have been long-established in FAR Part 77 and other Federal Aviation Administration regulations and guidelines. Also, state of California regulation of obstructions under the State Aeronautics Act (Public Utilities Code, Section 21659) is based on FAR Part 77 criteria.

Agency Responsibilities

Ensuring the maximum level of compatibility between the Reid-Hillview Airport and adjacent uses is the responsibility of five agencies: Santa Clara County, Santa Clara County Airport Land Use Commission, City of San Jose, California Division of Aeronautics, and the Federal Aviation Administration. Each agencies role is discussed below.

Santa Clara County

Santa Clara County has two roles related to land use compatibility. As owner and operator of the Reid-Hillview Airport, the county has a central role in ensuring the safety of aircraft operations and minimizing off-airport impacts. Although federal preemptions limit the County's authority, it remains responsible for implementation of modifications to the airfield to maximize safety and minimize off-airport effects. Santa Clara County is also responsible for implementing the noise insulation program proposed in the Part 150 Noise Management Program.

Santa Clara County also has jurisdiction over a limited amount of nonaviation land in the vicinity of the Reid-Hillview Airport. This includes nonaviation land uses on airport property and a few isolated properties in the vicinity of the airport.

Santa Clara County Airport Land Use Commission

Requirements for creation of airport land use commissions (ALUCs) were first established under the California State Aeronautics Act (Public Utility Code Sections 21670 et seq.) in 1967. Although the law has been amended numerous times since then, the fundamental purpose of ALUCs to promote land use compatibility around airports has remained unchanged. As expressed in the present statutes, this purpose is:

"...to protect public health, safety, and welfare by ensuring the orderly expansion of airports and the adoption of land use measures that minimize the public's exposure to excessive noise and safety hazards within areas around public airports to the extent that these areas are not already devoted to incompatible uses."

The statutes give ALUCs two principal powers by which to accomplish this objective. First, ALUCs must prepare and adopt an airport land use compatibility plan. Secondly, they must review the plans, regulations, and other actions of local agencies and airport operators for consistency with that plan.

The basic function of airport land use compatibility plans is to promote compatibility between airports and the land uses that surround them. Compatibility plans serve as a tool for use by airport land use commissions in fulfilling their duty to review proposed development plans for airports and surrounding land uses. Additionally, compatibility plans set compatibility criteria applicable to local agencies in their preparation or amendment of land use plans and ordinances and to landowners (including special district and other local government entities as well as private parties) in their design of new development.

The most recent version of the Santa Clara County Airport Land Use Commission's compatibility plan was adopted in September 1992. This document is entitled *Land Use Plan for Areas Surrounding Santa Clara County Airports*. As this is a key document, it is described in a separate section below.

Limitations

This fundamental objective notwithstanding, airport land use commissions are limited in their powers to achieve it. Two limitations are explicitly written into the law: ALUCs have no authority over either existing land uses (Section 21674(a)) or the operation of airports (Section 21674(e)). Neither of these terms is defined within the statutes, but the interpretation of their meaning is fairly standard throughout the state.

Existing Land Uses — The precise wording of the Aeronautics Act is that the authority of ALUCs extends only to land in the vicinity of airports that is "not already devoted to incompatible uses." The working interpretation of this language is that ALUCs have no state-empowered authority over existing land uses.

Operation of Airports — Any actions pertaining to how and where aircraft operate on the ground or in the air around an airport are clearly not within the jurisdiction of ALUCs to regulate. ALUC involvement with aircraft operations is limited to taking the operational characteristics into account in the development of land use compatibility plans. This limitation on the jurisdiction of ALUCs cannot, however, be taken to mean that they have no authority with respect to new development on airport property. For example, the law specifically requires ALUCs to review proposed airport master plans for consistency with the commission's plans. ALUCs also have authority to review proposals for nonaviation development on airport property.

A third, less absolute, limitation concerns the types of land use actions that are subject to ALUC review. The law emphasizes local general plans as the primary mechanism for implementing the compatibility policies set forth in an ALUC's plan. Thus, Santa Clara County and each city affected by an airport land use compatibility plan is required to make its general plan consistent with the ALUC plan (or to overrule the commission). Once a local agency has taken this action to the satisfaction of the Airport Land Use Commission, the ALUC's authority to review projects within that jurisdiction is narrowly limited. The only actions for which review remains mandatory are proposed adoption or amendment of general plans, specific plans, zoning ordinances, and building regulations affecting land within an airport influence area. For an ALUC to review individual projects, the local agency must agree to submit them.

One final limitation worth noting is that ALUCs have no jurisdiction over federal lands such as lands controlled by the U.S. Forest Service, Bureau of Land Management, or Indian tribes. ALUCs can merely inform these agencies about the ALUC policies and seek their cooperation.

City of San Jose

The City of San Jose has land use authority over most property in the vicinity of Reid-Hillview Airport. As such, the city has principal responsibility for ensuring that land uses in the vicinity of the airport are compatible with its operations. At Reid-Hillview, the opportunity for an optimum relationship between the airport and surrounding land uses was lost long ago. However, where changes in existing land uses are made, there still remains the potential to improve the degree of compatibility.

California Division of Aeronautics

The Division of Aeronautics has multiple roles that directly or indirectly affect compatibility. Annual airfield inspections supplement the ongoing inspections by airport staff. It provides an independent review of airfield conditions and potential obstructions in the approaches to the runways. Agency staff also monitors noise reduction strategies at airports designated as having a noise problems as defined in California's Airport Noise Regulations. The grant program administered by this agency is a potential source for land use compatibility planning and implementation of airfield safety improvements.

Federal Aviation Administration

The many divisions within the Federal Aviation Administration (FAA) play a variety of roles that affect compatibility around Reid-Hillview Airport. A few of those that have the most significant affect are mentioned in the text that follows. The staff of the FAA air traffic control tower has as their primary responsibility ensuring the separation of aircraft arriving and departing the Reid-Hillview Airport. At a busy airport with parallel runways, air traffic control contributes significantly to the safe operation of the airport. In a less direct manner, the FAA also contributes to safety through the promulgation of regulations relating to flight and designation of various classes of airspace. As a grant funding agency the FAA supports measures to reduce noise impacts and improve airfield safety. For example, the home insulation program recommended as part of the Part 150 Noise Mitigation Program is expected to be funded by the FAA.

Airport Land Use Compatibility Plan

The airport land use compatibility plan for an airport is the key document providing guidance on compatible land uses. As part of this master plan, the current plan has been evaluated.

The *Land Use Plan for Areas Surrounding Santa Clara Airports* is a comprehensive document. It begins with an introduction that describes the state-mandated purposes of airport land use commissions. The relationship to local planning agencies and airport owners is documented. The introduction is followed by a description of the public airports in Santa Clara County covered by the plan. Reid-Hillview Airport is one of these airports. Next there is an extensive discussion of the characteristics of aviation noise and its measurement. Safety issues are covered in the subsequent chapter. Recommended safety zones are also presented in this chapter. The next two sections contain implementation procedures and the ALUC's policies. The balance of the document contains a glossary and various appendices.

An administrative draft (dated March 2004) of a *Comprehensive Land Use Plan* for Reid-Hillview Airport has been posted to the official web site of the Santa Clara County Planning Office. Although this plan has not been adopted, it is believed to represent the direction that the ALUC is considering. The new plan differs principally in that it utilizes the standard safety zones contained in the *California Airport Land Use Planning Handbook* prepared by the Division of Aeronautics.

In the most general sense, both the adopted and draft compatibility plans contain policies that are judged to be technically supportable and appropriate for an airport with the characteristics of Reid-Hillview. This airport master plan contains some changes that should be incorporated into the compatibility plan:

- Airspace plan: has been modified to reflect the shift in the northern runway ends.
- Runway protection zones: reflects both the changes in runway ends and the use of standard runway protection zones, rather than the approach runway protection zones depicted in the prior airport layout plan

In addition to those mechanical changes, it is also recommended that other changes be considered:

- Reformat the plan so that policies are clearly differentiated from supporting text. Specifically, it is suggested that all text, tables, and figures associated with policies be placed in one section. Numbered headings should be reserved for policies.
- The Tall Structure Compatibility policies are an important component of county-wide policies. However, they are not logically part of the Reid-Hillview plan. Another vehicle for their adoption should be found.
- The infill policies should be reconsidered. The undeveloped acreage requirement is not clearly defined. Modifications to a single-family home that do not increase the number of dwelling units should be permitted without any formulas. There are no real safety or noise benefits to limiting additions to homes. However, limitations on additions may be perceived as unreasonable and contribute to an unfavorable view of the airport.

  More elaborate policies for land uses other than single-family should be developed.

Most of the area around the Reid-Hillview Airport is fully developed. Therefore, most attention should be focused on those parcels capable of being developed or significantly redeveloped. For example, the existing guidance for the mall properties should be expanded.

- Adoption of new policies for Reid-Hillview should be used as an opportunity to engage the key agency, the City of San Jose, to develop meaningful policies acceptable to both agencies. Reaching a mutually acceptable set of compatibility policies will likely require a significant commitment of staff time and other resources. However, the alternative is policies that are not implemented due to court challenges or an override. This process could also be used to define acceptable nonaviation uses on the airport. This process can occur as a stand-alone process or as part of the environmental documentation of the master plan adoption. A full-articulated compatibility plan could be considered a mitigation measure.

Appendix **B**

Glossary of Terms Used in Airport Master Planning

PREPARED BY

MEAD & HUNT
133 AVIATION BOULEVARD, SUITE 100
SANTA ROSA, CA 95403
(707) 526-5010

PREFACE

Many technical terms and expressions are used in airport master planning and noise management programs. This glossary has been prepared for the County of Santa Clara and interested members of the public. The definitions in this glossary were compiled from various sources including government publications such as Federal Aviation Administration (FAA) Advisory Circulars, FAA Orders, the Federal Aviation Regulations (FARs) and professional literature.

GLOSSARY OF TERMS

AAAE (Triple-A E) - American Association of Airport Executives.

A-WEIGHTED SOUND LEVEL (dBA) - The human ear does not respond equally to all sound frequencies. It is less efficient at low and high frequencies than it is at medium or speech-range frequencies. Thus, to obtain a single number representing the sound level of a noise having a wide range of frequencies in a manner representative of the ear's response, it is necessary to reduce the effects of the low and high frequencies with respect to the medium frequencies. The resultant sound level is said to be A-weighted, and the units are decibels (dB); hence, the abbreviation is dBA. The A-weighted sound level is also called the noise level. Sound level meters have an A-weighting network for measuring A-weighted sound level.

ABOVE GROUND LEVEL (AGL) - An elevation datum given in feet above ground level.

ABSORPTION - Absorption is a property of materials that reduces the amount of sound energy reflected. Thus, the introduction of an "absorbent" into the surfaces of a room will reduce the sound pressure level in that room because sound energy striking the room surfaces will not be totally reflected. The process of absorption is entirely different from that of transmission loss through a material, which determines how much sound enters a room via the walls, ceiling, and floor. The effect of absorption merely reduces the resultant sound level in the room produced by energy that has already entered the room.

AC - See **ADVISORY CIRCULAR**

ACOUSTICS - (1) The science of sound, including the generation, transmission, and effects of sound waves both audible and inaudible; (2) The physical qualities of a room or other enclosure (such as size, shape, amount of noise) that determine the audibility and perception of speech and music.

ADT - See **AVERAGE DAILY TRAFFIC**

ADVISORY CIRCULAR (AC) - A series of external FAA publications consisting of all non-regulatory material of a policy, guidance, and informational nature.

AERONAUTICAL CHART - A representation of a portion of the earth, its culture and relief, specifically designated to meet the requirements of air navigation.

AFFECTED LOCAL GOVERNMENT AGENCIES - The local government agencies that have the authority to control land uses in areas that are adversely affected by aviation activities.

AGL - See **ABOVE GROUND LEVEL**

AIM – See **AIRMAN'S INFORMATION MANUAL**

AIP PROGRAM - See **AIRPORT IMPROVEMENT PROGRAM**

AIR CARRIER - A legal entity who undertakes directly by lease or other arrangements, to engage in air transportation.

AIR CARRIER, CERTIFICATED ROUTE - An air carrier holding a Certificate of Public Convenience and Necessity, issued by the U.S. Department of Transportation under Part 121 of the Federal Aviation Regulations (FAR), to conduct scheduled services over specified routes and a limited amount of nonscheduled operations.

AIR CARRIER, COMMUTER - An air taxi operator who, under FAR Part 135, (1) performs at least five round trips per week between two or more points and publishes flight schedules which specify the times, days of the week, and places between which such flights are performed; or (2) transports mail by air pursuant to a contract with the U.S. Postal Service.

AIRCRAFT ACCIDENT - An occurrence associated with the operation of an aircraft which takes place between the time any person boards the aircraft with the intention of flight until such time as all such persons have disembarked, and in which any person suffers death or serious injury as a result of being in or upon the aircraft or by direct contact with the aircraft or anything attached thereto, or in which the aircraft receives substantial damage.

AIRCRAFT APPROACH CATEGORY - A grouping of aircraft based on a speed of 1.3 times the stall speed in the landing configuration at maximum gross landing weight. An aircraft shall fit in only one category. If it is necessary to maneuver at speeds in excess of the upper limit of a speed range for a category, the minimums for the next higher category should be used. For example, an aircraft which falls in Category A, but is circling to land at a speed in excess of 91 knots, should use the approach Category B minimums when circling to land. The categories are as follows:

1. Category A. Speed less than 91 knots.
2. Category B. Speed 91 knots or more but less than 121 knots.
3. Category C. Speed 121 knots or more but less than 141 knots.
4. Category D. Speed 141 knots or more but less than 166 knots.
5. Category E. Speed 166 knots or more.

AIRCRAFT CLASSES – For the purposes of Wake Turbulence Separation Minima, ATC classifies aircraft as Heavy, Large, and Small as follows:

1. Heavy. Aircraft capable of takeoff weights of 300,000 pounds or more whether or not they are operating at this weight during a particular phase of flight.
2. Large. Aircraft of more than 12,500 pounds, maximum certificated takeoff weight, up to 300,000 pounds.
3. Small. Aircraft of 12,500 pounds or less maximum certificated takeoff weight.

AIRCRAFT PARKING LINE LIMIT (APL) - A line established by the airport authorities beyond which no part of a parked aircraft should protrude.

AIRFIELD CAPACITY (HOURLY) - The maximum number of aircraft operations (landings or takeoffs) that can take place on an airfield in one hour under specific conditions.

AIRMAN'S INFORMATION MANUAL (AIM) - A primary FAA publication whose purpose is to instruct airmen about operating in the National Airspace System of the U.S. It provides basic flight information, ATC Procedures and general instructional information concerning health, medical facts, factors affecting flight safety, accident and hazard reporting, and types of aeronautical charts and their use.

AIRPORT - An area of land or water that is used or intended to be used for the landing and taking off of aircraft, and includes its buildings and facilities, if any.

AIRPORT ELEVATION - The highest point of an airport's usable runways, measured in feet above mean sea level.

AIRPORT ENVIRONS - The area surrounding an airport that is considered to be directly affected by the presence and operation of that airport.

AIRPORT HAZARD - Any structure or natural object located on or in the vicinity of a public airport, or any use of land near such airport, that obstructs the airspace required for the flight of aircraft landing, taking off, or taxiing at the airport.

AIRPORT IMPROVEMENT PROGRAM (AIP) - The AIP program is administered to provide financial grants-in-aid for airport development projects such as runways, taxiways, aircraft parking aprons, terminal buildings and land acquisition associated with airport development including runway protection zones and approach protection.

AIRPORT LAND USE COMMISSION (ALUC) - In California, a state-authorized body existing in each county having the responsibility to develop plans for achieving land use compatibility between airports and their environs.

AIRPORT LAND USE PLAN (ALUP) - In California, the formal plan, developed and adopted by an ALUC, setting forth criteria, policies and specifications for the preservation of long-term, land use compatibility between an airport and its environs.

AIRPORT LAYOUT PLAN - A plan (drawings) for an airport showing boundaries and proposed additions to all areas owned or controlled by the sponsor for airport purposes, the location and nature of existing and proposed airport facilities and structures, and the location on the airport of existing and proposed non-aviation areas and improvements thereon.

AIRPORT MASTER PLAN - An assembly of appropriate documents and drawings covering the development of a specific airport from a physical, economic, social, and political jurisdictional perspective. The Airport Layout Plan is a part of this plan.

AIRPORT NOISE COMPATIBILITY PLANNING STUDY - A study designed to increase the compatibility of land and facilities in the areas surrounding an airport that are most directly affected by the operation of the airport. The specific purpose is to reduce the adverse effects of noise as much as possible by implementing both on-airport noise control measures and off-airport land use control programs. The basic products of an Airport Noise Compatibility Planning Study typically include:

(1) workable on-airport noise abatement actions such as preferential runway use programs, new or preferential flight tracks, curfews, etc.;
(2) off-airport land use control programs and regulations such as land acquisition, soundproofing, or special actions and programs; and
(3) policies and procedures related to the implementation of on-airport and off-airport programs.

A community involvement program is usually carried on throughout all phases of the study. Conduct of such studies are eligible for federal funding participation. (Also see FAR Part 150.)

AIRPORT PROPRIETOR - Owner of an airport or other party having authority to control airport operations. In California, the holder of an airport permit issued by the Department of Transportation, Division of Aeronautics pursuant to Article 3, Chapter 4, Part 1, Division 9, Public Utilities Code.

AIRPORT RADAR SERVICE AREA (ARSA) - Regulatory airspace surrounding designated airports wherein FAA Air Traffic Control provides radar vectoring and sequencing on a full-time basis for all IFR and VFR aircraft. As of September 1993, the term ARSA has been replaced by the term Class C Airspace.

AIRPORT REFERENCE POINT - A point established on an airport, having an equal relationship to all existing and proposed landing and takeoff areas, and used to geographically locate the airport for other planning purposes.

AIRPORT SPONSOR - A public agency or tax-supported organization, such as an airport authority, that is authorized to own and operate an airport, to obtain property interests, to obtain funds, and to be legally, financially, and otherwise able to meet all applicable requirements of the current laws and regulations.

AIRPORT SURVEILLANCE RADAR (ASR) - Approach control radar used to detect and display an aircraft's position in the terminal area. ASR provides range and azimuth information but does not provide elevation data. Coverage of the ASR can extend up to 60 miles.

AIRPORT TRAFFIC AREA - Unless otherwise specifically designated in FAR Part 93, that airspace within a horizontal radius of 5 statute miles from the geographical center of any airport at which a control tower is operating, extending from the surface up to, but not including, an altitude of 3,000 feet above the elevation of an airport. Unless otherwise authorized by ATC, no person may operate an aircraft within an airport traffic area except for the purpose of landing at or taking off from an airport within that area. ATC authorizations may be given as individual approval of specific operations or may be contained in written agreements between airport users and the tower concerned.

AIRPORT TRAFFIC CONTROL TOWER (ATCT) - A terminal facility that uses air-to-ground communications, visual signaling, and other devices to provide ATC services to aircraft operating in the vicinity of an airport or on the movement area.

AIR ROUTE SURVEILLANCE RADAR (ARSR) - Air route traffic control center (ARTCC) radar used primarily to detect an aircraft's position which en route between terminal areas, enabling controllers to provide radar air traffic control service when aircraft are within the ARSR coverage.

AIR ROUTE TRAFFIC CONTROL CENTER (ARTCC) - An FAA facility established to provide air traffic control service to aircraft operating on an instrument flight rule (IFR) flight plan within controlled airspace and principally during the en route phase of flight.

AIR TAXI - Operations performed by operators of aircraft holding an air taxi certificate under Part 135 of the Federal Aviation Regulations. This category includes commuter airline operations (excluding certificated commuter airlines), mail carriers under contract with the U.S. Postal Service, and operators of nonscheduled air taxi services. Typically, air taxis do not utilize aircraft with a payload capacity over 7,500 pounds or capable of carrying more than 30 passengers.

AIR TRAFFIC - Aircraft operating in the air or on an airport surface, exclusive of loading ramps and parking areas.

AIR TRAFFIC CLEARANCE/ATC CLEARANCE - An authorization by air traffic control, for the purpose of preventing collision between known aircraft, for an aircraft to proceed under specified traffic conditions within controlled airspace.

AIR TRAFFIC CONTROL (ATC) - A service operated by appropriate authority (the FAA) to promote the safe, orderly, and expeditious flow of air traffic.

AIRWAY/FEDERAL AIRWAY - A Class E airspace area established in the form of a corridor, the centerline of which is defined by radio navigational aids. (See also **CONTROLLED AIRSPACE**.)

ALERT AREA - A special use airspace which may contain a high volume of pilot training activities or an unusual type of aerial activity, neither or which is hazardous to aircraft.

ALPA - Airline Pilot's Association.

ALTITUDE - The height of a level, point, or object measured in feet Above Ground Level (AGL) or from Mean Sea Level (MSL).

ALUC - See **AIRPORT LAND USE COMMISSION**

ALUP - See **AIRPORT LAND USE PLAN**

AMBIENT NOISE - The total of all noise in a system or situation, independent of the presence of the specific sound to be measured. In acoustical measurements, strictly speaking, ambient noise means electrical noise in the measurement system. However, in popular usage ambient noise means is also used with the same meaning as "background noise" or "residual noise." (See also **AMBIENT NOISE LEVEL**.)

AMBIENT NOISE LEVEL – The composite of noise from all sources near and far. The ambient noise level constitutes the normal or existing level of environmental noise at a given location. (i.e., the background noise level.)

APPROACH CLEARANCE - Authorization by ATC for a pilot to conduct an instrument approach at an airport with appropriate facilities.

APPROACH LIGHT SYSTEM (ALS) - An airport lighting system which provides visual guidance enabling a pilot to align the aircraft with the extended runway centerline during final approach to landing.

APPROACH SPEED - The recommended speed contained in aircraft manuals used by pilots when making an approach to landing. This speed will vary for different segments of an approach as well as for aircraft weight and configuration.

APRON/RAMP - A defined area on an airport or heliport intended to accommodate aircraft for purposes of loading passengers or cargo, refueling, parking, or maintenance.

ARSR - See **AIR ROUTE SURVEILLANCE RADAR**

ARTCC - See **AIR ROUTE TRAFFIC CONTROL CENTER**

ASNA - See **AVIATION SAFETY AND NOISE ABATEMENT ACT OF 1979**

ASR - See **AIRPORT SURVEILLANCE RADAR**

ATA - Air Transport Association.

ATC - See **AIR TRAFFIC CONTROL**

ATIS - See **AUTOMATIC TERMINAL INFORMATION SERVICE**

AUTOMATED WEATHER OBSERVING SYSTEM (AWOS) - Airport electronic equipment which automatically measures meteorological parameters, reduces and analyzes the data via computer, and broadcasts weather information which can be received on aircraft radios.

AUTOMATIC TERMINAL INFORMATION SERVICE (ATIS) - The continuous broadcast of recorded non-control information in selected terminal areas (e.g. time, weather, ceiling, visibility, etc.).

AVERAGE DAILY TRAFFIC (ADT) - An expression of traffic volume, ADT means the average number of vehicles per day that pass over a given point.

AVIATION SAFETY AND NOISE ABATEMENT ACT OF 1979 (ASNA) - Public Law 96-193, enacted February 18, 1980. The purpose of the Act is to provide assistance to airports in preparing and carrying out noise compatibility programs and in assuring continued safety for aviation. The Act also contains provisions that extend, until January 1, 1988, the requirement for

certain types of aircraft to comply with Part 36 of the Federal Aviation Regulations (see also FAR Part 36 and FAR Part 150). Funding for the noise studies has been appropriated by the U.S. Congress and has commenced in 1983. Funding for program implementation, including acquisition and soundproofing of affected residences, has been approved by FAA and is being implemented at several U.S. airports.

AVIGATION EASEMENT - A type of acquisition of an interest in land or property which involves less-than-fee purchase (see also **LESS-THAN-FEE ACQUISITION**). One form of avigation easement grants an airport the right to perform aircraft operations over the designated property, including operations that might cause noise, vibration, and other effects. A stronger form of easement is a deed restriction that may include (1) the right to perform aircraft operations on the property, and (2) public acquisition of a landowner's rights restricting future development of the property for any use more intensive than that existing at the time of the transaction. This easement may also include specific prohibitions on the uses for which the property may be developed. Maximum heights of structures and other objects may also be specified.

AZIMUTH - Horizontal direction or bearing; usually measured from the reference point of 0 degrees clockwise through 360 degrees.

BACKCOURSE APPROACH - A non-precision instrument approach utilizing the rearward projection of the ILS localizer beam.

BACKGROUND NOISE - See **AMBIENT NOISE**.

BAFFLE - A baffle is a shielding structure or series of partitions used to increase the effective length of the external transmission path between two points in an acoustic system. For example, baffles may be used in sound traps (as in air conditioning ducts) or in automotive mufflers to decrease the sound transmitted while affording a path for airflow.

BASED AIRCRAFT - Aircraft stationed at an airport on a long-term or permanent basis, usually by some form of agreement between the aircraft owner and airport management.

BASE LEG - A flight path at right angles to the landing runway off its approach end. The base leg normally extends from the downwind leg to the intersection of the extended runway centerline. (See also **TRAFFIC PATTERN**.)

BLAST PAD - A paved area, of runway width, extending beyond the runway takeoff threshold for a sufficient distance (typically 150 to 300 feet) to prevent soil erosion caused by jet engine backblast.

BUILDING CODE - A legal document that sets forth requirements to protect the public health, safety and general welfare as they relate to the construction and occupancy of buildings and structures. The code establishes the minimum acceptable conditions for matters found to be in need of regulation. Topics generally covered are exits, fire protection, structural design, sanitary facilities, light, and ventilation. Sound insulation may also be included.

BUILDING RESTRICTION LINE (BRL) - A line established with respect to the runway centerline to assure that structures will not project above the imaginary surfaces required by Federal Aviation Regulations, Part 77, *"Obstruction Clearance Criteria,"* (FAR Part 77).

BUSINESS AVIATION - The sector of general aviation (as defined by ICAO) which concerns the operation of aircraft by companies for the carriage of passengers or goods as an aid to the conduct of their business, flown for purposes generally considered not for public hire, and piloted by individuals having at the minimum a valid commercial pilot license with an instrument rating.

CALIFORNIA ENVIRONMENTAL QUALITY ACT (CEQA) – An Act of the State of California designed to:

(1) Inform governmental decision-makers and the public about the potential, significant environmental effects of proposed activities.
(2) Identify the ways that environmental damage can be avoided or significantly reduced.
(3) Prevent significant, avoidable damage to the environment by requiring changes in projects through the use of alternatives or mitigation measures when the governmental agency finds the changes to be feasible.
(4) Disclose to the public the reasons why a governmental agency approved the project in the manner the agency chose if significant environmental effects are involved. (CEQA Guidelines, Sec. 15002[a]).

CATEGORICAL EXEMPTION - An exemption from CEQA for classes of projects based on findings by the secretary of the resources agency that the listed classes of projects do not have a significant effect on the environment.

CBD - Central Business District

CEILING - Height above the earth's surface to the lowest layer of clouds or obscuring phenomena that is reported as "broken," "overcast," or "obscuration" and not classified as "thin" or "partial."

CEQ - See **COUNCIL ON ENVIRONMENTAL QUALITY**

CEQ 1500 - Regulations of the Federal Council on Environmental Quality (CEQ) for implementing the procedural provisions of the National Environmental Policy Act (NEPA).

CEQA - See **CALIFORNIA ENVIRONMENTAL QUALITY ACT**

CERTIFICATED ROUTE AIR CARRIER - See **AIR CARRIER, CERTIFICATED ROUTE**

CIRCLING APPROACH/CIRCLE-TO-LAND MANEUVER - A maneuver initiated by the pilot to align the aircraft with a runway for landing when a straight-in landing from an instrument approach is not possible or not desirable.

CLEAR ZONE - See **RUNWAY PROTECTION ZONE**

CLEARWAY - For turbine engine powered airplanes certificated after August 29, 1959, an area beyond the runway, not less than 500 feet wide, centrally located about the extended centerline of the runway, and under the control of the airport authorities. The clearway is expressed in terms of clearway plane, extending from the end of the runway with an upward slope not exceeding 1.25 percent, above which no object nor any terrain protrudes. However, threshold lights may protrude above the plane if their height above the end of the runway is 26 inches or less and if they are located to each side of the runway.

CNEL - See **COMMUNITY NOISE EQUIVALENT LEVEL**.

COMMON TRAFFIC ADVISORY FREQUENCY (CTAF) - A frequency designed for the purpose of carrying out airport advisory practices while operating to or from an uncontrolled airport. The CTAF may be a UNICOM, Multicom, FSDS, or tower frequency and is identified in appropriate aeronautical publications.

COMPASS LOCATOR - A low power, low or medium frequency radio beacon installed at the site of the outer or middle marker of an instrument landing system (ILS).

COMMUNITY NOISE EQUIVALENT LEVEL (CNEL) - A method of predicting, by a single number rating, cumulative aircraft noise that affects communities in airport environs. As defined in the California Airport Noise Standards, CNEL represents the average daytime noise level during a 24-hour day, adjusted to an equivalent level to account for the lower tolerance of people to noise during evening and nighttime periods relative to the daytime period. Weighting factors equivalent to penalties of about five decibels and ten decibels are applied to operations conducted from 7:00 PM to 10:00 PM and from 10:00 PM to 7:00 AM, respectively, to account for increased sensitivity during those periods.

COMMUTER AIR CARRIER - See **AIR CARRIER, COMMUTER**

COMPREHENSIVE LAND USE PLAN (CLUP) - See **ALUP**.

COMPUTER MODELING - An analytical process which employs an electronic digital computer to perform difficult, laborious calculations involving mathematical functions or formulas. Computation of cumulative noise exposure (Ldn or CNEL) contours requires the use of computer modeling in order to process enormous quantities of data concerning aircraft traffic, performance and operating procedures.

CONTROLLED AIRSPACE - Any of several types of airspace within which some or all aircraft may be subject to air traffic control. An airspace of defined dimensions within which air traffic control service is provided to IFR flights and to VFR flights in accordance with the airspace classification. Controlled airspace is a generic term that covers Classes A-E airspace. Controlled airspace is also that airspace within which all aircraft operators are subject to certain pilot qualifications, operating rules, and equipment requirements in Part 91 (for specific operating requirements, please refer to Part 91). For IFR operations in any class of controlled airspace, a pilot must file an IFR flight plan and receive an appropriate ATC clearance. Each Class B, Class C, and Class D airspace area designated for an airport contains at lest one primary airport around which the

airspace is designated (for specific designations and descriptions of the airspace classes, refer to FAR Part 71).

COUNCIL ON ENVIRONMENTAL QUALITY (CEQ) - Established by the National Environmental Policy Act (NEPA) of 1969, the Council is composed of three members appointed by the President. A major purpose of the Council is to formulate and recommend national policies to promote the improvement of environmental quality.

CTAF - See **COMMON TRAFFIC ADVISORY FREQUENCY**.

DATABASE - A computer file (or set of files) containing a field of related numerical information (data) for use in automated analysis or processing. A computerized "land use database" is a computer file containing the coordinates, dimensions and areas of all individual land use polygons which comprise the pattern of land use within a specific geographic area.

DAY-NIGHT AVERAGE SOUND LEVEL (DNL or Ldn) - A method for predicting, by a single number rating, cumulative aircraft noise that affects communities in airport environs. The Ldn value represents decibels of noise as measured by an A-weighted sound-level meter (see also). In the Ldn procedure, the noise exposure from each aircraft takeoff or landing at ground level around an airport is calculated, and these noise exposures are accumulated for a typical 24-hour period. (The 24-hour period often used is the average day of the year being analyzed.) Daytime and nighttime noise exposures are considered separately. A weighting factor equivalent to a penalty of 10 decibels is applied to operations between 10:00 p.m. and 7:00 am to account for the increased sensitivity of people to nighttime noise. The Ldn values can be expressed graphically on maps using contours of equal noise exposure. Ldn may also be used for measuring other noise sources, such as automobile traffic, to determine combined noise effects.

dB - See **DECIBEL, dB**

DECIBEL, dB - A unit for describing the amplitude of sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of he sound measured to the reference pressure, which is 20 micropascals (20 micronewtons per square meter).

DEREGULATION ACT - Airline regulatory reform act of 1978. Designed, among other things, to encourage competition among domestic air carriers, the Act allows an air carrier greater freedom to enter and leave any given market.

DEVELOPMENT RIGHTS - Rights of landowners to develop a parcel of land according to the zoning of that parcel. Land is often assessed on a combination of its "resource" value and its "commodity" value. The resource value is the value of the property in its natural state; the commodity value is an artificial value placed on it by the marketplace - that is, its value for development purposes. In less-than-fee acquisition (see also), the airport sponsor purchases only the development rights; the ownership of the land remains unchanged.

DIGITIZE - A mechanical-electronic process whereby the locations, sizes and identities of individual polygons, noise contours or other physical features are translated into a set of numerical

data within a computer data file or database for subsequent automated analysis, sorting or manipulation.

DISPLACED THRESHOLD - A runway landing threshold that is located at a point other than the designated beginning of the runway (where departures would begin).

DISTANCE MEASURING EQUIPMENT (DME) - Equipment (airborne and ground) used to measure, in nautical miles, the slant range distance of an aircraft from the DME navigational aid.

DME - See **DISTANCE MEASURING EQUIPMENT**

DNL - See **DAY-NIGHT AVERAGE SOUND LEVEL**

DOWNWIND LEG - A flight path parallel to the landing runway in the direction opposite the landing direction.

DURATION - Length of time, in seconds, a noise event such as an aircraft flyover is experienced. (May refer to the length of time a noise event exceeds a specified threshold level.)

EA - See **ENVIRONMENTAL ASSESSMENT**

EFFECTS - See **IMPACT**

EIR - See **ENVIRONMENTAL IMPACT REPORT**

EIS - See **ENVIRONMENTAL IMPACT STATEMENT**

ENGINE RUN-UP AREA - An area on an airport where aircraft engines are serviced or tested. The noise from such servicing or testing can affect neighborhoods adjacent to the airport.

ENVIRONMENTAL ASSESSMENT (EA) - An assessment of the environmental effects of a proposed action for which federal financial assistance is being requested or for which federal authorization is required. The EA serves as the basis for the FAA's Environmental Impact Statement (EIS) or Finding of No Significant Impact (FONSI), as specified in FAA Orders 1050.1D and 5050.4.

ENVIRONMENTAL IMPACT REPORT (EIR) – An EIR is a detailed statement prepared in accordance with CEQA describing a proposed project, analyzing significant environmental effects of the proposed project, identifying a reasonable range of alternatives, and discussing possible ways to mitigate or avoid the significant environmental effects.

ENVIRONMENTAL IMPACT STATEMENT (EIS) - A document prepared under the requirements of the National Environmental Policy Act of 1969 (NEPA), Section 102(2)(c). The EIS represents a federal agency's evaluation of the effect of a proposed action on the environment. New regulations relating to the preparation of an EIS are published in FAA Orders 1050.1D and 5050.4.

ENPLANED/DEPLANED PASSENGERS - The volume of passengers outbound from an airport (enplaned) or inbound to an airport (deplaned). The annual passenger volume of an airport is the total of enplaned and deplaned passengers.

EQUIVALENT ENERGY LEVEL, Leq - The sound level corresponding to a steady state sound level containing the same total energy as a time varying signal over a given sample period. Leq is typically computed over 1, 8 and 24-hour sample periods.

EPA - The U.S. Environmental Protection Agency

FAA - See **FEDERAL AVIATION ADMINISTRATION**

FAA NOISE POLICY - The Aviation Noise Abatement Policy of the Department of Transportation, Federal Aviation Administration issued on November 18, 1976. The policy outlines the responsibilities and actions that may be taken to reduce adverse effects of aviation-related noise.

FAA ORDER - An internal FAA directive which sets standards, procedures and guidelines for FAA execution of its various regulatory and grant administration mandates.

FAA ORDER 1050.1D - An order published by the FAA, dated December 21, 1983, entitled *"Policies and Procedures for Considering Environmental Impacts."* This order was prepared in response to the CEQ 1500 Regulations.

FAA ORDER 5050.4A - This document, entitled *"Airport Environmental Handbook,"* was revised by the FAA on October 8, 1985. It contains all of the essential information an airport sponsor needs to meet both procedural and substantive environmental requirements, including relevant text from Order 1050.1D.

FAR – See **FEDERAL AVIATION REGULATIONS (FAR)**

FAR PART 36 - Federal Aviation Regulations, Part 36. Establishes noise standards for the civil aviation fleet. Some extensions for compliance are included in the Aviation Safety and Noise Abatement Act of 1979 (see also).

FAR PART 77 - Federal Aviation Regulations, Part 77. Establishes standards for identifying obstructions to aircraft in navigable airspace.

FAR PART 77 SURFACES - Imaginary surfaces established with relation to each runway of an airport. There are five types of surfaces: (1) primary, (2) approach, (3) transitional, (4) horizontal, and (5) conical.

FAR PART 91 – Establishes criteria for general operating and flight rules.

FAR PARTS 121 AND 135 - The parts of Federal Aviation Regulations that deal with certification and operational requirements for commercial operators of large aircraft and air taxis, respectively.

FAR PART 150 - Federal Aviation Regulations, Part 150. Effective February 28, 1982, FAR Part 150 is the regulation which implements the noise compatibility standards and provisions contained in the Aviation Safety and Noise Abatement Act of 1979 (ASNA). FAR Part 150 prescribes procedures for airport sponsors who wish to develop Noise Exposure Maps and Airport Noise Compatibility Plans to identify and mitigate airport - land use compatibility problems. FAR Part 150 was published in the Federal Register in amended form September 14, 1993.

FBO - See **FIXED BASE OPERATOR**.

FEDERAL AVIATION ADMINISTRATION - The FAA is the agency of the U.S. Department of Transportation that is charged with (1) regulating air commerce to promote its safety and development; (2) achieving the efficient use of navigable airspace of the United States; (3) promoting, encouraging, and developing civil aviation; (4) developing and operating a common system of air traffic control and air navigation for both civilian and military aircraft; and (5) promoting the development of a national system of airports.

FEDERAL AVIATION REGULATIONS (FAR) - Regulations establishes by the Federal Aviation Administration (FAA). These regulations are the rules which govern the operation of aircraft, airways, and airmen.

FEE-SIMPLE LAND ACQUISITION (PURCHASE) - The full purchase by the airport sponsor of land and improvements. The land is usually maintained for airport purposes or leased for uses that are compatible with airport operations. Alternatively, the airport sponsor can resell the land with an avigation easement (see also) and deed restrictions that specify the compatible land uses that are permitted. The resale option has the benefit that the land is returned to the tax rolls.

FERRY FLIGHT – A flight for the purpose of:

1. Returning an aircraft to base.
2. Delivering an aircraft from one location to another.
3. Moving an aircraft to and from a maintenance base.

FINDING OF NO SIGNIFICANT IMPACT (FONSI) - An administrative determination by the FAA that a proposed action by the airport sponsor will have no significant impact (on the environment). Specific guidelines for the preparation of a FONSI report (see EA) are included in FAA Orders 1050.1D and 5050.4A.

FIXED BASE OPERATOR (FBO) – (1) A business operating at an airport that provides aircraft services to the general pubic, including but not limited to sale of fuel and oil; aircraft sales, rental, maintenance and repair; parking and tie down or storage of aircraft; flight instruction; air taxi/charter operations; and specialty services, such as instrument and avionics maintenance, painting, overhaul, aerial application, aerial photography, aerial hoists or pipeline patrol. (2) The owner of such an operation.

FLIGHT PATH/TRACK - A line, course, or track along which an aircraft is flying or intended to be flown.

FLIGHT SERVICE STATION (FSS) - FAA facilities that provide pilot briefings on weather, airports, altitudes, routes, and other flight planning information. More specifically, these FSS facilities also provide en route communications and VFR search and rescue services, assist lost aircraft and aircraft in emergency situations, relay ATC clearances, originate Notices to Airmen, broadcast aviation weather and NAS information, receive and process IFR flight plans, and monitor NAVAID's. In addition, at selected locations, FSS's provide Enroute Flight Advisory Service (Flight Watch), take weather observations, issue airport advisories, and advise Customs and Immigration of transborder flights.

FLIGHT STANDARDS DISTRICT OFFICE (FSDO) - An FAA field office serving an assigned geographical area and staffed with Flight Standards personnel who serve the aviation industry and the general public on matters relating to the certification and operation of air carrier and general aviation aircraft. Activities include general surveillance of operational safety, certification of airmen and aircraft, accident prevention, investigation, enforcement, etc.

FLIGHT WATCH - A shortened term for use in air-ground contacts to identify the flight service station providing En Route Flight Advisory Service; e.g., "Oakland Flight Watch."

FLIGHT VISIBILITY - See **VISIBILITY**.

FLOW CONTROL - Measures designed to adjust the flow of traffic into a given airspace, along a given route, or bound for a given aerodrome (airport) so as to ensure the most effective utilization of the airspace.

FONSI - See **FINDING OF NO SIGNIFICANT IMPACT**

GENERAL AVIATION (GA) - All civil aviation except that classified as air carrier or air taxi. The types of aircraft typically used in general aviation activities vary from multi-engine jet aircraft to single-engine piston aircraft.

GENERAL AVIATION OPERATIONS - Operations performed by all civil aircraft not classified as air carrier or air taxi aircraft.

GLIDE SLOPE (GS) - An electronic signal radiated by a component of an ILS to provide descent path guidance to approaching aircraft.

GLOBAL POSITIONING SATELLITE SYSTEM (GPS) - A navigational system utilizing satellites to provide non-precision guidance in azimuth, elevation, and distance measurement.

GROUND VISIBILITY - See **VISIBILITY**.

HEAVY AIRCRAFT - Aircraft capable of takeoff weights of 300,000 pounds or more whether or not they are operating at this weight during a particular phase of flight.

HELICOPTER - Rotorcraft that, for its horizontal motion, depends principally on its engine-driven rotors.

HELIPAD - A small, designated area, usually with a prepared surface, on a heliport, airport, landing/takeoff area, apron/ramp, or movement area used for takeoff, landing, or parking of helicopters.

HELIPORT – An area of land, water, or structure used or intended to be used for the landing and takeoff of helicopters and includes its buildings and facilities if any.

HUD - The U.S. Department of Housing and Urban Development

ICAO – International Civil Aviation Organization.

IFR - See **INSTRUMENT FLIGHT RULES**

IFR CONDITIONS - Weather conditions that require aircraft to be operated in accordance with instrument flight rules.

IFR MINIMUMS AND DEPARTURE PROCEDURES (FAR PART 91) - Prescribed takeoff rules. For some airports, obstructions or other factors require the establishment of nonstandard takeoff minimums or departure procedures, or both. Both may be required to assist pilots in avoiding obstacles during climb to the minimum en-route altitude.

ILS - See **INSTRUMENT LANDING SYSTEM**.

ILS CATEGORIES –

1. ILS Category I – An ILS approach procedure which provides for approach to a height above touchdown of not less than 200 feet and with runway visual range of not less than 1,800 feet.
2. ILS Category II – An ILS approach procedure which provides for approach to a height above touchdown of not less than 100 feet and with runway visual range of not less than 1,200 feet.
3. ILS Category III.
    a. IIIA – An ILS approach procedure which provides for approach without a decision height minimum and with runway visual range of not less than 700 feet.
    b. IIIB – An ILS approach procedure which provides for approach without a decision height minimum and with runway visual range of not less than 150 feet.
    c. IIIC – An ILS approach procedure which provides for approach without a decision height minimum and without runway visual range minimum.

IMPACT - In environmental and noise control studies, the word "impact" is used to express the extent or severity of an environmental problem, e.g., the number of persons exposed to a given noise environment. As indicted in CEQ 1500 (Section 1508.8), impacts and effects are considered to be synonymous. Effects or impacts may be ecological, aesthetic, historic, cultural, economic, social, or health related, and they may be direct, indirect, or cumulative.

IMPACT INSULATION CLASS (IIC) - A single-figure rating that is intended to permit comparisons of the sound-insulating merits of floor-ceiling assemblies in terms of a reference contour.

INCOMPATIBLE LAND USE - Residential, public, recreational and certain other noise-sensitive land uses which are designated as unacceptable within specific ranges of cumulative (Ldn) noise exposure as set forth in Table 2 of Appendix A of FAR Part 150.

INSTRUMENT APPROACH PROCEDURE - A series of predetermined maneuvers for the orderly transfer of an aircraft under instrument flight conditions from the beginning of the initial approach to a landing or to a point from which a landing may be made visually. It is prescribed and approved for a specific airport by competent authority.

INSTRUMENT FLIGHT RULES (IFR) - Rules specified by the FAA for flight under weather conditions in which visual reference cannot be made to the ground and the pilot must rely on instruments to fly and navigate.

INSTRUMENT LANDING SYSTEM (ILS) - An electronic system which provides the aircraft with lateral, longitudinal and vertical guidance necessary for an instrument landing.

INSTRUMENT OPERATION - An aircraft operation in accordance with an IFR flight plan or an operation where IFR separation between aircraft is provided by a terminal traffic control facility.

INSTRUMENT RUNWAY - A runway equipped with electronic and visual navigation aids for which a precision or non-precision approach procedure having straight-in landing minima has been approved.

INVERSE SQUARE LAW - Describes the reduction in sound pressure where the mean square sound pressure changes in inverse proportion to the square of the distance from the source. Under this ideal condition, the sound pressure level decreases 6dB with each doubling of distance from the source.

ITINERANT OPERATION - An arrival or departure performed by an aircraft from or to a point beyond the local airport area. Also defined as all aircraft arrivals and departures other than local operations.

LAND USE COMPATIBILITY - The compatibility of land uses surrounding an airport with airport activities and particularly with the noise from aircraft operations.

LAND USE COMPATIBILITY ASSURANCE - Documentation provided by an airport sponsor to the FAA. The documentation is related to an application for an airport development grant. Its purpose is to assure that a reasonably appropriate action, including the adoption of zoning laws, has been taken or will be taken to restrict the use of land adjacent to the airport or in the immediate vicinity of the airport. Such uses are limited to activities and purposes compatible with normal airport operations, including the landing and takeoff of aircraft. This assurance is required of airport sponsors by Section 511 (a) (5) of the Airport and Airway Improvement Act of 1981. (Also see AIP Program.)

LAND USE CONTROLS - Controls established by local or state governments to carry out land use planning. The controls include zoning, subdivision regulations, land acquisition (in fee simple,

lease-back, or easements), building codes, building permits, and capital improvement programs (or provide sewer, water, utilities, or other service facilities).

LAND USE PLANNING - Comprehensive planning carried out by units of local government, for all areas under their jurisdiction, to identify the optimum uses of land and to serve as a basis for the adoption of zoning or other land use controls.

LARGE AIRCRAFT - An aircraft of more than 12,500 pounds maximum certificated takeoff weight, up to 300,000 pounds.

Ldn - See **DAY-NIGHT AVERAGE SOUND LEVEL**

Lmax - The maximum A-weighted noise level recorded during a noise event.

LEAD AGENCY - In California, the public agency that has the principal responsibility for carrying-out or approving a project. The Lead Agency will decide whether an EIR or Negative Declaration will be required for the project and will cause the document to be prepared. Criteria for determining which agency will be the Lead Agency for a project are contained in Section 15051 of the CEQA guidelines.

Leq - See **EQUIVALENT ENERGY LEVEL, Leq**

LESS-THAN-FEE ACQUISITION (PURCHASE) - The purchase of development rights (see also) from landowners by airport sponsors in areas that should remain at very low densities or in open space uses. The airport sponsor negotiates with the landowner to determine the fair market value of the unused development rights. Once sold, the land cannot be developed except in specified ways. (See also **FEE-SIMPLE m LAND ACQUISITION**.)

Lmax - See **MAXIMUM A-WEIGHTED NOISE LEVEL**

LOC - See **LOCALIZER**.

LOCAL AGENCY - In California, any public agency other than a state agency, board, or commission. "Local Agency" includes but is not limited to cities, counties, charter cities and counties, districts, school districts, special districts, redevelopment agencies, local agency formation commissions, and any board, commission, or organizational subdivision of a local agency when so designated by order or resolution of the governing legislative body of the local agency.

LOCAL OPERATION - An aircraft operation which remains no more than 25 nautical miles from the departure point, or which terminates at the point of departure, or which does not include a stop of a greater duration than 15 minutes. Touch-and-go operations are local operations.

LOCAL TRAFFIC - Aircraft operating in the traffic pattern or within sight of the tower, or aircraft known to be departing or arriving from flight in local practice areas, or aircraft executing practice instrument approaches at the airport.

LOCALIZER (LOC) - The component of an ILS which provides horizontal course guidance to the runway.

LOCALIZER TYPE DIRECTIONAL AID (LDA) - A NAVAID used for non-precision instrument approaches with utility and accuracy comparable to a localizer, but which is not part of a complete ILS and is not aligned with the runway.

LOUDNESS - The judgment of the intensity of a sound by a person. Loudness depends primarily on the sound pressure of the stimulus. Over much of the loudness range it takes about a tenfold increase in sound pressure (approximately 10 decibels) to produce a doubling of loudness.

LOW APPROACH - An approach over an airport or runway following an instrument approach or a VFR approach including the go-around maneuver where the pilot intentionally does not make contact with the runway.

MAJOR AIRPORT DEVELOPMENT - Airport development of such a scale as to require shifts in patterns of population movement and growth, public service demands, and changes in business and economic activity.

MARKER BEACON - The component of an ILS which informs pilots that they are at a significant point on the approach course.

MASKING - The action of making one sound (audible when heard alone) inaudible or unintelligible by the introduction of another sound. The masking is most marked when the masked sound is of higher frequency than the masking sound.

MEAN SEA LEVEL (MSL) - An elevation datum given in feet above mean sea level.

MICROWAVE LANDING SYSTEM (MLS) - An advanced electronic system of ground-based devices and aircraft avionics which provides the aircraft with lateral, longitudinal and vertical guidance necessary for an instrument landing. In the U.S., MLS technology has been supplanted by GPS (which see).

MILITARY OPERATION - Operations performed by military groups, such as the Air National Guard, the U.S. Air Force, U.S. Army, U.S. Marine Corps, or the U.S. Navy.

MILITARY OPERATIONS AREA (MOA) - A type of special use airspace established to separate certain military activities from IFR traffic and to identify for VFR traffic where these activities are conducted.

MINIMUM DESCENT ALTITUDE (MDA) - The lowest altitude, expressed in feet above mean sea level, to which descent is authorized on final approach or during circle-to-land maneuvering in execution of a standard instrument approach procedure where no electronic glide slope is provided.

MINIMUM SAFE ALTITUDE - The minimum altitude specified in Part 91 for various aircraft operations.

MINIMUMS - Weather condition requirements established for a particular operation or type of operation; e.g., IFR takeoff or landing, alternate airport for IFR flight plans, VFR flight, etc.

MISSED APPROACH –

1. A maneuver conducted by a pilot when an instrument approach cannot be completed to a landing. The route of flight and altitude are shown on instrument approach procedure charts. A pilot executing a missed approach prior to the Missed Approach Point (MAP) must continue along the final approach to he MAP. The pilot may climb immediately to the altitude specified in the missed approach procedure.
2. A term used by the pilot to inform ATC that he is executing the missed approach.
3. At locations where ATC radar service is provided, the pilot should confirm to radar vectors when provided by ATC in lieu of the published missed approach procedure.

MITIGATION MEASURE - An action that can be planned or taken to alleviate (mitigate) an adverse environmental impact. As set forth in CEQ 1500 (Section 1508.20), "mitigation" includes:

(a) Avoiding the impact altogether by not taking a certain action or parts of an action.
(b) Minimizing the impact by limiting the degree or magnitude of the action and its implementation.
(c) Rectifying the impact by repairing, rehabilitating, or restoring the affected environment.
(d) Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action.
(e) Compensating for the impact by replacing or providing substitute resources or environments.

A proposed airport development project, or alternatives to that project, may constitute a mitigation measure as defined by the CEQ. CEQA contains a similar definition of mitigation measure (Cal. Pub. Res. Code 21002, et seq.).

MLS - See **MICROWAVE LANDING SYSTEM**

MSL – See **MEAN SEA LEVEL**

NATIONAL AIRSPACE SYSTEM/NAS - The common network of U.S. airspace; air navigation facilities, equipment and services, airports or landing areas; aeronautical charts, information and services; rules, regulations and procedures, technical information, and manpower and material. Included are system components shared jointly with the military.

NAVAID - See **NAVIGATIONAL AID**

NAVIGATIONAL AID (NAVAID) - Any visual or electronic device (airborne or on the ground) that provides point-to-point guidance information or position data to pilots of aircraft in flight.

NDB – See NONDIRECTIONAL RADIO BEACON (NDB)

NEPA - National Environmental Policy Act of 1969 (PL 91-190).

NOISE - Any sound or signal that is undesirable because it interferes with speech and hearing, or is intense enough to damage hearing, or is otherwise annoying.

NOISE ABATEMENT PROCEDURES - Changes in operational procedures affecting runway use, in flight approach and departure routes and procedures, and in other air traffic procedures that are made to shift adverse aviation effects away from noise-sensitive areas (such as residential neighborhoods).

NOISE ATTENUATION OF BUILDINGS - The use of building materials to reduce noise through absorption, transmission loss, and reflection of sound energy.

NOISE COMPLAINT - A recorded complaint concerning aircraft noise made by an individual and kept on file at an airport.

NOISE CONTOURS - Lines drawn on a map that connect points of equal noise exposure (Ldn or CNEL) values. They are usually drawn in 5-dB intervals, such as Ldn 75 dB values, Ldn 70 dB values, Ldn 65 dB values, and so forth.

NOISE CONTROL PLANS - Documentation by the airport sponsor of actions to be taken by the sponsor to reduce the effect of aviation noise. These actions are to be taken by the sponsor either alone or in cooperation with the FAA, airport users, and affected units of local government, with appropriate comments from affected citizens. Alternative actions should be considered, particularly where proprietary use restrictions (see also) on aircraft operations are involved).

NOISE LEVEL REDUCTION (NLR) - The noise reduction between indoor and outdoor environments of two rooms is the numerical difference, in decibels, of the average sound pressure levels in those areas or rooms. A measurement of "noise level reduction" combines the effect of the transmission loss performance of the structure plus the effect of acoustic absorption present in the receiving room.

NOISE-SENSITIVE LAND USE - Land uses that can be adversely affected by high levels of aircraft noise. Residences, schools, hospitals, religious facilities, libraries, and other similar uses are often considered to be sensitive to noise.

NONCOMPATIBLE LAND USE - See **INCOMPATIBLE LAND USE**.

NONDIRECTIONAL RADIO BEACON (NDB) - A low or medium frequency radio beacon transmitting non-directional signals whereby the pilot of an aircraft equipped with direction finding equipment can determine his bearing to or from the radio beacon and "home" on or track to or from the station.

NONPRECISION APPROACH PROCEDURE - A standard instrument approach procedure in which no electronic glideslope is provided, such as VOR, GPS, or LOC (which "see").

NONPRECISION INSTRUMENT RUNWAY - A runway with an instrument approach procedure utilizing air navigation facilities, with only horizontal guidance, or area-type navigation equipment for which a straight-in non-precision instrument approach procedure has been approved or planned, and no precision approach facility or procedure is planned.

NOTAM – See **NOTICE TO AIRMEN**

NOTICE TO AIRMEN - A notice containing information (not known sufficiently in advance to publicize by other means) concerning the establishment, condition, or change in any component (facility, service, or procedure of, or hazard in the National Airspace System) the timely knowledge of which is essential to personnel concerned with flight operations.

OBSTACLE - An existing object, object of natural growth, or terrain, at a fixed geographical location, or which may be expected at a fixed location within a prescribed area, with reference to which vertical clearance is or must be provided during flight operation.

OBSTACLE FREE ZONE (OFZ) - A volume of space above and adjacent to a runway and its approach lighting system if one exists, free of all fixed objects except FAA-approved frangible aeronautical equipment and clear of vehicles and aircraft in the proximity of an airplane conducting an approach, missed approach, landing, takeoff, or departure.

OBSTRUCTION - An object that exceeds a limiting height or penetrates an imaginary surface described by current Federal Aviation Regulations (Part 77).

OPERATION - A take-off or a landing.

ORDER - See **FAA ORDER**.

OUTER MARKER - A marker beacon at or near the glide slope intercept position of an ILS approach.

PAPI - See **PRECISION APPROACH PATH INDICATOR**

PILOT IN COMMAND - The pilot responsible for the operation and safety of an aircraft during flight time.

POLYGON - An irregular geometric figure, encoded into a computer database, coincident with the physical conterminous boundaries of a single land use category. Individual polygons are encoded into a computer database using a process termed "digitizing."

PRECISION APPROACH PATH INDICATOR (PAPI) - An airport landing aid similar to a VASI, but which has light units installed in a single row rather than two rows.

PRECISION APPROACH PROCEDURE – A standard instrument approach procedure in which an electronic glideslope/glidepath is provided; e.g., ILS/MLS and PAR.

PRECISION INSTRUMENT PROCEDURE - A standard instrument procedure for an aircraft to approach an airport in which an electronic glide slope is provided, e.g., an instrument landing system (ILS) or military precision approach radar.

PRECISION INSTRUMENT RUNWAY - A runway with an instrument approach procedure utilizing an instrument landing system (ILS), microwave landing system (MLS), precision approach radar (PAR), or GPS.

PREFERENTIAL RUNWAY USE (PROGRAM) - A noise abatement action whereby the FAA Air Traffic Division, in conjunction with the FAA Airports Division, assists the airport sponsor in developing a program that gives preference to the use of a specific runway(s) to reduce overflight of noise-sensitive areas.

PROPRIETARY USE RESTRICTIONS - Restrictions by an airport sponsor on the number, type, class, manner, or time of aircraft operations at the airport The imposition of a curfew is an example of a proprietary use restriction.

PUBLIC AGENCY - In California, includes any state agency, board, or commission and any local or regional agency, as defined in the CEQA guidelines. It does not include the courts of the state. The term does not include agencies of the federal government.

RADAR APPROACH CONTROL FACILITY - A terminal ATC facility that uses radar and non-radar capabilities to provide approach control services to aircraft arriving, departing, or transiting airspace controlled by the facility. Provides radar ATC services to aircraft operating in the vicinity of one or more civil and/or military airports in a terminal area. Specific facility nomenclatures are used for administrative purposes only and are related to the physical location of the facility and the operating service generally as follows:

- Army Radar Approach Control/ARAC (Army),
- Radar Air Traffic Control Facility/RATCF (Navy/FAA),
- Radar Approach Control/RAPCON (Air Force/FAA),
- Terminal Radar Approach Control/TRACON (FAA),
- Tower/Airport Traffic Control Tower/ATCT (FAA) [only those towers delegated approach control authority].

REIL - See **RUNWAY END IDENTIFIER LIGHTS**

RELIEVER AIRPORT - An airport serving general aviation aircraft that might otherwise use a congested air carrier airport.

RESPONSIBLE AGENCY - In California, a public agency which proposes to carry out or approve a project, for which a Lead Agency is preparing or has prepared an EIR or Negative Declaration. For purposes of CEQA, the term "Responsible Agency" includes all public agencies other than the Lead Agency which have discretionary approval power over the project.

RESTRICTED AREA - Designated airspace within which the flight of aircraft, while not wholly prohibited, is subject to restriction.

RETROFIT - The retroactive modification of existing jet aircraft engines for noise abatement purposes.

RUNWAY - A defined rectangular area on a land airport prepared for the landing and takeoff run of aircraft along its length. Runways are normally numbered in relation to their magnetic direction rounded off to the nearest 10 degrees; e.g., Runway 01, Runway 25.

RUNWAY EDGE LIGHTS - Lights used to define the lateral limits of a runway.

RUNWAY END IDENTIFIER LIGHTS (REILs) - Two synchronized flashing lights, one on each side of the runway threshold, which provide a pilot with a rapid and positive visual identification of the approach end of a particular runway.

RUNWAY HEADING - The magnetic direction indication by the runway number. When cleared to "fly/maintain runway heading," pilots are expected to comply with the ATC clearance by flying the heading indicated by the runway number without applying any drift correction; e.g., Runway 4, 040^{O} magnetic heading; Runway 20, 200^{O} magnetic heading.

RUNWAY PROTECTION ZONE - A trapezoidal area at ground level whose perimeter conforms to the projection on the ground of the innermost portion of the Approach Surface as defined in FAR Part 77. The runway protection zone is centered on the extended runway centerline and begins at the end of the FAR Part 77 Primary Surface, terminating below the line where the Approach Surface reaches a height of 50 feet above the elevation of the runway end. FAA regulations require that runway protection zones be kept free of obstructions and any uses that cause an assemblage of persons.

RUNWAY SAFETY AREA - A cleared, drained, graded, and preferably turfed area symmetrically located about the runway which, under normal conditions, is capable of supporting snow removal, fire fighting, and rescue equipment and of accommodating the occasional passage of aircraft without causing major damage to the aircraft.

RUNWAY THRESHOLD - The beginning of that portion of a runway usable for landing or takeoff. (See also **DISPLACED THRESHOLD**.)

RUNWAY USE PROGRAM - See **PREFERENTIAL RUNWAY USE PROGRAM**

SEL – See **SOUND EXPOSURE LEVEL (SEL)**

SEVERE NOISE EXPOSURE - Exposure to aircraft noise that is likely to interfere with human activity in noise-sensitive areas; repeated vigorous complaints can be expected and group action is probable. This exposure may be specified by a cumulative noise descriptor as a level of noise exposure, such as the Ldn (or CNEL) 75 dB level. (See also **SIGNIFICANT NOISE EXPOSURE**.)

SHIELDING - The attenuation of a sound by placing walls, buildings, plants, or other barriers between a sound source and the receiver.

SIGNIFICANT ENVIRONMENTAL EFFECT - A significant effect on the environment is a substantial or potentially substantial adverse change in the physical conditions of the area affected by a project.

SIGNIFICANT NOISE EXPOSURE - Exposure to aircraft noise that is likely to interfere with human activity in noise-sensitive areas; individual complaints may be expected and group action is possible. This exposure may be specified by a cumulative noise descriptor as a level of noise exposure, such as the Ldn (or CNEL) 65 dB level. (See also **SEVERE NOISE EXPOSURE**.)

SMALL AIRCRAFT - Aircraft of 12,500 pounds or less maximum certificated takeoff weight.

SOUND EXPOSURE LEVEL (SEL) – The level of noise accumulated during a single noise event, such as an aircraft overflight, with reference to a duration of one second. More specifically, it is the level of time-integrated A-weighted squared sound pressure for a stated time interval or event, based on the reference pressure of 20 micronewtons per square meter and reference duration of one second.

SOUND INSULATION - (1) The use of structures and materials designed to reduce the transmission of sound from one room or area to another, or from the exterior to the interior of a building, (2) the degree of reduction in sound transmission by means of sound insulating structures and materials.

SOUND LEVEL (NOISE LEVEL) - The weighted sound pressure level obtained by the use of a sound level meter having a standard frequency filter for attenuating or accentuating part of the sound spectrum.

SOUND LEVEL METER - An instrument, comprising a microphone, an amplifier, an output meter, and frequency weighting networks, that is used to measure noise and sound levels in a specified manner.

SOUND TRANSMISSION CLASS (STC) - The preferred single figure rating system designed to give an estimate of the sound insulation properties of a partition or a rank ordering of a series of partitions. It is intended for use primarily when speech and office noise constitute the principal noise problem.

SOUND TRANSMISSION LOSS - A measure in decibels of sound insulation provided by a structural configuration.

SPECIAL USE AIRSPACE - Airspace of defined horizontal and vertical dimensions wherein activities must be confined because of their nature and/or wherein limitations may be imposed upon aircraft operations that are not a part of those activities.

SPECIAL VFR CONDITIONS - Meteorological conditions that are less than those required for basic VFR flight in Class B,C,D, or E surface areas and in which some aircraft are permitted flight under visual flight rules.

SPECIAL VFR OPERATIONS - Aircraft operating in accordance with clearances within Class B, C, D, and E surface areas in weather conditions less than the basic VFR weather minima. Such operations must be requested by the pilot and approved by ATC.

STANDARD - A specific statement by an authority of permitted environmental conditions.

STANDARD INSTRUMENT DEPARTURE (SID) - A pre-planned instrument flight rules (IFR) air traffic control departure procedure printed for pilot use in graphic and/or textual form. SIDs provide transition from the terminal to the appropriate en route structure.

STANDARD TERMINAL ARRIVAL ROUTE (STAR) - A pre-planned instrument flight rules (IFR) air traffic control arrival route published for pilot use in graphic and/or textual form. STARs provide transition from the en route structure to an outer fix or an instrument approach fix/arrival waypoint in the terminal area.

STOPWAY - An area beyond the takeoff runway, no less wide than the runway and centered upon the extended centerline of the runway, able to support the aircraft during an aborted takeoff, without causing structural damage to the aircraft, and designated by the airport authorities for use in decelerating the aircraft during an aborted takeoff.

STRAIGHT-IN INSTRUMENT APPROACH - An instrument approach wherein final approach is begun without first having executed a procedure turn; it is not necessarily completed with a straight-in landing or made to straight-in landing weather minima.

SUBDIVISION REGULATIONS (ORDINANCE) - Regulations promulgated by local governments to guide development in defined ways and by prescribed methods to control the use of private land in the public interest. Subdivision regulations were initially established to prevent (1) the uncontrolled subdivisions of land that often left communities without adequate streets, water mains, or sewers, and (2) disorderly, chaotic growth - urban sprawl.

SUBSTANTIAL EVIDENCE - Under CEQA, if there is substantial evidence that a project may have a significant environmental effect, an EIR must be prepared. Substantial evidence includes facts, reasonable assumptions based on facts, and expert opinions supported by facts. The following are *not* substantial evidence: argument, speculation, unsubstantiated opinion or narrative, clearly inaccurate or erroneous information, or evidence of social or economic impacts that do not contribute to, or are not caused by, physical impacts on the environment.

TAXI - The movement of an airplane under is own power on the surface of an airport. Also, it descries the surface movement of helicopters equipped with wheels.

TAXILANE - The portion of the aircraft parking area used for access between taxiways, aircraft parking positions, hangars, storage facilities, etc.

TAXIWAY - A defined path, from one part of an airport to another, selected or prepared for the taxiing of aircraft.

TERMINAL AIRSPACE - See **TERMINAL AREA**.

TERMINAL AREA - A general term used to describe airspace in which approach control service or airport traffic control service is provided.

TERMINAL INSTRUMENT PROCEDURES (TERPS) - Procedures for instrument approach and departure of aircraft to and from civil and military airports. There are four types of terminal instrument procedures: (1) precision approach, (2) non-precision approach, (3) circling, and (4) departure.

TERPS - Terminal Instrument Procedures.

THRESHOLD - The beginning of that portion of the runway usable for landing.

TOUCH-AND-GO OPERATION - A practice maneuver consisting of a landing and a takeoff performed in one continuous movement—the aircraft lands and begins takeoff roll without stopping. A touch-and-go is considered as two operations.

TOWER - See **AIRPORT TRAFFIC CONTROL TOWER (ATCT)**.

TRAFFIC PATTERN - The traffic flow that is prescribed for aircraft landing at, taxiing on, or taking off from an airport. The components of a typical traffic pattern are upwind leg, crosswind leg, downwind leg, base leg, and final approach.

1. Upwind Leg – A flight path parallel to the landing runway in the direction of landing.
2. Crosswind Leg – A flight path at right angles to the landing runway off its upwind end.
3. Downwind Leg – A flight path parallel to the landing runway in the direction opposite to landing. The downwind leg normally extends between the crosswind leg and the base leg.
4. Base Leg – A flight path at right angles to the landing runway off its approach end. The base leg normally extends from the downwind leg to the intersection of the extended runway centerline.
5. Final Approach – A flight path in the direction of landing along the extended runway centerline. The final approach normally extends from the base leg to the runway. An aircraft making a straight-in approach VFR is also considered to be on final approach.

TRANSFER OF DEVELOPMENT RIGHTS (TDR) - TDR involves separate ownership and use of the various rights associated with a parcel of real estate. Under the TDR concept, some of the property's development rights (see also) are transferred to another location where they may be used to intensify allowable development. For example, lands within an area affected by aircraft noise could be kept in open space or agricultural uses, and development rights for residential or other uses could be transferred to locations outside the area. Landowners could be compensated for the transferred rights by their sale at the new locations, or the rights could be purchased by the airport. Depending on market conditions and legal requirements, the airport could either hold or resell the rights.

TRANSIENT AIRCRAFT - Aircraft not based at the airport.

TRANSITIONAL AIRSPACE - That portion of controlled airspace wherein aircraft change from one phase of flight or flight condition to another.

TRANSMISSOMETER - An apparatus used to measure runway visibility on an ILS runway.

TRANSPORT AIRPORT - An airport designed, constructed, and maintained to serve airplanes having approach speeds of 121 knots or more.

TURBOJET AIRCRAFT - An aircraft having a jet engine in which the energy of the jet operates a turbine which in turn operates the air compressor.

TURBOPROP AIRCRAFT - An aircraft having a jet engine in which the energy of the jet operates a turbine which drives the propeller.

UNICOM (Aeronautical Advisory Station) - A non-government air/ground radio communication facility which may provide airport information (winds, weather, etc.) at specific airports.

UTILITY AIRPORT - An airport designed, constructed, and maintained to serve airplanes having approach speeds less that 121 knots.

URBAN GROWTH MANAGEMENT (UGM) - The identification and management of the demands on municipal facilities, improvements or services created by any proposed residential, commercial, industrial, or other type of development. UGM is intended to (1) provide the means for satisfying such demands, 92) identify any harmful effects of development, and (3) protect the jurisdictions and their residents against such harmful effects by minimizing the costs of municipal facilities, improvements, and services. The intent of UGM is usually not to prevent development or growth, but rather to avoid free or disorganized development or growth in the UGM area, which is generally located in and around the fringe of an urban area. The UGM area usually is either relatively undeveloped or predominantly agricultural and lacks most, if not all, municipal facilities, improvements, or services.

ULTRALIGHT VEHICLE - An aeronautical vehicle operated for sport or recreational purposes which does not require FAA registration, an airworthiness certificate, nor pilot certification. They are primarily single-occupant vehicles, although some two-place vehicles are authorized for training purposes. Operation of an ultralight vehicle in certain airspace requires authorization from ATC.

VASI - See **VISUAL APPROACH SLOPE INDICATOR**

VECTOR - A heading issued to a pilot to provide navigational guidance by radar.

VERY HIGH FREQUENCY (VHF) OMNIDIRECTIONAL RANGE (VOR) - The standard navigational aid used throughout the airway system to provide bearing information to aircraft. When combined with Tactical Air Navigation (TACAN) the facility, called VORTAC, provides distance as well as bearing information.

VFR - See VISUAL FLIGHT RULES

VFR CONDITIONS - Weather conditions that permit aircraft to be operated in accordance with visual flight rules.

VICTOR AIRWAY - A control area or portion thereof established in the form of a corridor, the centerline of which is defined by VOR's.

VISIBILITY - The ability, as determined by atmospheric conditions and expressed in units of distance, to see and identify prominent unlighted objects by day and prominent lighted objects by night. Visibility is reported as statute miles, hundreds of feet or meters.

1. *Flight Visibility*. The average forward horizontal distance, from the cockpit of an aircraft in flight, at which prominent unlighted objects may be seen and identified by day and prominent lighted objects may be seen and identified by night.
2. *Ground Visibility*. Prevailing horizontal visibility near the earth's surface as reported by the United States National Weather Service or an accredited observer.

VISUAL APPROACH - An approach to an airport wherein an aircraft on an IFR flight plan, operating in VFR conditions under the control of a radar facility and having an air traffic control authorization, may deviate from the prescribed instrument approach procedure and proceed to the airport of destination, served by an operational control tower, by visual reference to the surface.

VISUAL APPROACH SLOPE INDICATOR (VASI) - An airport landing aid which provides a pilot with visual descent (approach slope) guidance while on approach to landing. See also **PAPI**.

VISUAL FLIGHT RULES (VFR) - Rules that govern the procedures for conducting flight under visual conditions (Federal Aviation Regulations, Part 91).

VISUAL RUNWAY - A runway intended solely for the operation of aircraft using visual approach procedures, with no straight-in instrument approach procedure and no instrument designation indicated on an FAA-approved airport layout plan.

VOR - See **VERY HIGH FREQUENCY OMNIDIRECTIONAL RANGE**

WAKE TURBULENCE - Phenomena resulting from the passage of an aircraft through the atmosphere. The term includes vortices, thrust stream turbulence, jet blast, jet wash, propeller wash, and rotor wash both on the ground and in the air.

WARNING AREA – Airspace which may contain hazards to non-participating aircraft in international airspace.

WIND SHEAR - A change in wind speed and/or wind direction in a short distance resulting in a tearing or shearing effect. It can exist in a horizontal or vertical direction and occasionally in both.

ZONING AND ZONING ORDINANCES - Ordinances that divide a community into zones or districts according to the present and potential use of properties for the purpose of controlling and directing the use and development of those properties. Zoning is concerned primarily with the use of land and buildings, the height and bulk of buildings, the proportion of a lot which buildings may cover, and the density of population of a given area. As an instrument of plan implementation, zoning deals principally with the use and development of privately owned land and buildings. The objective of zoning legislation is to establish regulations that provide locations for all essential uses

of land and buildings and to ensure that each use is located in the most appropriate place. In FAR Part 150 planning, zoning can be used to achieve two major airs: (1) to reinforce existing compatible land uses and promote the location of future compatible uses in vacant or undeveloped land, and (2) to convert existing non-compatible uses to compatible uses over time.

Noise Model Calculation Data

Reid-Hillview Airport

Table 1

Existing (2002) Itinerant Operations (Arrivals and Departures are equal and half of listed number) and Local Operations (Two Operations per Local Pattern)

Aircraft (INM)	Operations						
	Type	Annual	%	Day	Evening	Night	Total
Single-Engine, Propeller, (GASEPF)	Itinerant	11,987	5.08%	27.0100	4.7140	1.1160	**32.8400**
	Local	23,010	9.75%	53.6740	9.3680	0.0000	**63.0420**
Single-Engine, Propeller, (CNA172)	Itinerant	55,938	23.70%	126.0500	22.0020	5.2040	**153.2560**
	Local	107,383	45.49%	250.4780	43.7220	0.0000	**294.2000**
Twin-Engine Propeller, Piston (BEC58P)	Itinerant	3,197	1.35%	7.2020	1.2580	0.2980	**8.7580**
	Local	6,136	2.60%	14.3140	2.4980	0.0000	**16.8120**
Single-Engine, Turboprop (GASEPV)	Itinerant	7,992	3.39%	18.0080	3.1440	0.7440	**21.8960**
	Local	15,340	6.50%	35.7820	6.2460	0.0000	**42.0280**
Business Turboprop (Twin) (CNA441)	Itinerant	2,332	0.99%	5.3780	0.9380	0.0740	**6.3900**
Helicopter (H500D)	Itinerant	1,060	0.45%	2.8500	0.0540	0.0000	**2.9040**
	Local	867	0.37%	2.3320	0.0440	0.0000	**2.3760**
	Run-ups	554	0.23%	1.4910	0.0280	0.0000	**1.5190**
Helicopter (B206L)	Itinerant	117	0.05%	0.3160	0.0060	0.0000	**0.3220**
	Local	96	0.04%	0.2600	0.0040	0.0000	**0.2640**
	Run-ups	62	0.03%	0.1660	0.0030	0.0000	**0.1690**
TOTAL		**236,071**	**100.00%**	**545.3110**	**94.0290**	**7.4360**	**646.7760**

Table 2

Five-Year Forecast (2007) Itinerant Operations (Arrivals and Departures are equal and half of listed number) and Local Operations (Two Operations per Local Pattern)

Aircraft (INM)	Operations						
	Type	Annual	%	Day	Evening	Night	Total
Single-Engine, Propeller, (GASEPF)	Itinerant	13,351	5.06%	30.1260	5.3800	1.0720	**36.5780**
	Local	25,753	9.76%	59.8660	10.6900	0.0000	**70.5560**
Single-Engine, Propeller, (CNA172)	Itinerant	62,304	23.62%	140.5900	25.1060	5.0000	**170.6960**
	Local	120,180	45.56%	279.3720	49.8880	0.0000	**329.260**
Twin-Engine Propeller, Piston (BEC58P)	Itinerant	3,560	1.35%	8.0340	1.4340	0.2860	**9.7540**
	Local	6,867	2.60%	15.9640	2.8500	0.0000	**18.8140**
Single-Engine, Turboprop (GASEPV)	Itinerant	8,900	3.37%	20.0840	3.5860	0.7140	**24.3840**
	Local	17,168	6.51%	39.9100	7.1260	0.0000	**47.0360**
Business Turboprop (Twin) (CNA441)	Itinerant	2,608	0.99%	6.0000	1.0720	0.0720	**7.1440**
Helicopter (H500D)	Itinerant	1,185	0.45%	3.1840	0.0620	0.0000	**3.2460**
	Local	969	0.37%	2.6040	0.0500	0.0000	**2.6540**
	Run-ups	619	0.23%	1.6650	0.0320	0.0000	**1.6970**
Helicopter (B206L)	Itinerant	131	0.05%	0.3540	0.0060	0.0000	**0.3600**
	Local	108	0.04%	0.2900	0.0060	0.0000	**0.2960**
	Run-ups	69	0.03%	0.1850	0.0040	0.0000	**0.1890**
TOTAL		**263,772**	**100.00%**	**608.2280**	**107.2920**	**7.1440**	**722.6640**

Table 3

Twenty-Year Forecast (2022) Itinerant Operations (Arrivals and Departures are equal and half of listed number) and Local Operations (Two Operations per Local Pattern)

Aircraft (INM)	Operations						
	Type	Annual	%	Day	Evening	Night	Total
Single-Engine, Propeller, (GASEPF)	Itinerant	12,451	5.06%	28.0940	5.0180	1.0000	**34.1120**
	Local	24,016	9.76%	55.8290	9.9690	0.0000	**65.7980**
Single-Engine, Propeller, (CNA172)	Itinerant	58,103	23.62%	131.1100	23.4140	4.6620	**159.1860**
	Local	112,076	45.56%	260.5340	46.5240	0.0000	**307.0580**
Twin-Engine Propeller, Piston (BEC58P)	Itinerant	3,320	1.35%	7.4920	1.3380	0.2660	**9.0960**
	Local	6,404	2.60%	14.8880	2.6580	0.0000	**17.5460**
Single-Engine, Turboprop (GASEPV)	Itinerant	8,300	3.37%	18.7300	3.3440	0.6660	**22.7400**
	Local	16,010	6.51%	37.2190	6.6450	0.0000	**43.8640**
Business Turboprop (Twin) (CNA441)	Itinerant	2,432	0.99%	5.5960	1.0000	0.0680	**6.6640**
Helicopter (H500D)	Itinerant	1,105	0.45%	2.9700	0.0580	0.0000	**3.0280**
	Local	903	0.37%	2.4280	0.0470	0.0000	**2.4750**
	Run-ups	578	0.23%	1.5530	0.0300	0.0000	**1.5830**
Helicopter (B206L)	Itinerant	123	0.05%	0.3300	0.0060	0.0000	**0.3360**
	Local	101	0.04%	0.2700	0.0060	0.0000	**0.2760**
	Run-ups	65	0.03%	0.1730	0.0040	0.0000	**0.1770**
TOTAL		**245,988**	**100.00%**	**567.2160**	**100.0610**	**6.6620**	**673.9390**

Table 4

Time of Day Distribution for All Years (2002, 2007, and 2022)

Aircraft Type		Percentage of Operations by Aircraft Type		
		Day 7:00 a.m. 7:00 p.m.	Evening 7:00 p.m. 10:00 p.m.	Night 10:00 p.m. 7:00 a.m.
Single-Engine, All Twin-Engine, Propeller, Piston	Takeoff	82.0%	15.0%	3.0%
	Landing	82.0%	15.0%	3.0%
	Local	85.0%	15.0%	0.0%
Helicopter	Takeoff	98.0%	2.0%	0.0%
	Landing	98.0%	2.0%	0.0%
	Local	98.0%	2.0%	0.0%
	Run-up	98.0%	2.0%	0.0%

Table 5

Runway Utilization (2002 and 2007)

Aircraft Type		Percentage of Takeoffs and Landings						
		Runway 13L	Runway 31R	Runway 13R	Runway 31L	Helipad Y	Helipad X	Helipad H
Fixed Wing	Day	9.8	55.2	5.2	29.8	–	–	–
	Evening	9.8	55.2	5.2	29.8			
	Night	9.8	55.2	5.2	29.8			
	Locals	7.5	55.0	7.5	30.0			
Helicopter	Day	–	–	–	–	100.0	0.0	0.0
	Evening					100.0	0.0	0.0
	Night					100.0	0.0	0.0
	Locals					0.0	0.0	100.0
	Hovers					0.5	1.0	98.5

Table 6

Runway Utilization (2022)

Aircraft Type		Percentage of Takeoffs and Landings						
		Runway 13L	Runway 31R	Runway 13R	Runway 31L	Helipad Y	Helipad X	Helipad H
Fixed Wing	Day	9.8	55.2	5.2	29.8	–	–	–
	Evening	9.8	55.2	5.2	29.8			
	Night	15.0	85.0	0.0	0.0			
	Locals	7.5	55.0	7.5	30.0			
Helicopter	Day	–	–	–	–	100.0	0.0	0.0
	Evening					100.0	0.0	0.0
	Night					100.0	0.0	0.0
	Locals					0.0	0.0	100.0
	Hovers					0.5	1.0	98.5

Table 7

Flight Tracks – Takeoff, All Fixed-Wing Aircraft, All Years

Percentage of Track Usage by Runway									
Runway 13L		Runway 31R				Runway 13R		Runway 31L	
Straight Out	Left turn to Downwind	Right turn	Left turn	Left turn to Left Downwind	Right turn to Right Downwind	Straight Out	Right turn to Downwind	Left turn to Downwind	Straight Out
50.0	50.0	25.0	25.0	25.0	25.0	50.0	50.0	50.0	50.0

Table 8

Flight Tracks – Landing, All Fixed-Wing Aircraft, All Years

Percentage of Track Usage by Runway						
Runway 13L	**Runway 31R**		**Runway 13R**	**Runway 31L**		
Left Downwind	**Straight In**	**Right Downwind**	**Right Downwind**	**Straight In**	**Right Downwind**	**Left Downwind**
100.0	50.0	50.0	100.0	33.4	33.3	33.3

Table 9

Flight Tracks – Helipad Y, All Rotary-Wing Aircraft, All Years

	Percentage of Track Usage by Runway						
Operation	**Straight Out**	**North Arrival, Circle North, Land South**	**North Arrival, Circle South, Land North**	**South Arrival, Circle North, Land South**	**South Arrival, Circle South, Land North**	**Right Downwind to Land South**	**Left Downwind to Land North**
Departure	100.0	-	-	-	-	-	-
Arrival	-	25.0	25.0	25.0	25.0	-	-
Local	-	-	-	-	-	85.0	15.0

Source: Data compiled by Mead & Hunt and HMMH (October 2004)

ENVIRONMENTAL FACTORS

Development projects for Reid-Hillview Airport will occur within the regulatory structure of the State of California (including its subunits) and the United States. Both levels of government have environmental regulations that must be considered. This section is intended to identify potential environmental concerns that should be assessed as part of the environmental review.

Biological

Potential biological issues were identified based upon information gathered from prior field investigations not associated with the Master Plan. Based upon these investigations, only one biological issue has been identified.

Sensitive Species — There are no federal or state listings for endangered species on the airport site. However, the Department of Fish and Game has observed the following species on the airport, which is listed as Species of Special Concern:

- Burrowing Owl (*Athene cunicularia*)

The last official documentation of Burrowing Owls occurred on a Department of Fish and Game visit on January 23, 2004. Burrowing Owls were located on airport property just west of the intersection of Tully Road and Capitol Expressway. However, the species is known to relocate nesting sites. Near-term field investigations may be appropriate prior to development on the airport. No other biological topics have been identified.

Geology and Soils

Geology—Reid-Hillview Airport is located in the San Andreas Fault Zone (SAFZ), with the San Andreas Fault located approximately 10 miles west of the airport, and the Calaveras Fault less then 5 miles to the east. The Working Group on California Earthquake Probabilities estimates that there is a 70 percent probability that one or more large earthquakes will occur within the San Francisco Bay Area during the 30 year period 2000 to 2030. Therefore, it is reasonable to expect that the airport would be subject to intense shaking during the life of the Airport Master Plan. This factor should be considered in the design of new facilities, but is not a significant constraint to development.

Soils—The Reid-Hillview Airport is not located in a fault rupture hazard zone, compressible soil hazard zone, landslide hazard zone or dike failure hazard zone. The airport has been mapped as having a range of liquefaction potential from "moderate" to "high". Most of the

airport has moderate liquefaction susceptibility. Small portions in the northeastern and northwestern corners of the airport have high liquefaction susceptibility. This factor should be considered in the design of new facilities, but is not a significant constraint to development.

Hazards and Hazardous Material

Some of Reid-Hillview Airport facilities contain fuels, oils and other hazardous materials normally associated with operation and maintenance of aircraft, buildings and the airfield. None of the uses are known to present a significant risk.

Aircraft accidents are statistically rare. The areas of greatest concern lie immediately beyond the runway ends. Federal Aviation Administration advisory circular on airport design (AC 150/5300-13) recommends airport acquisition of land beyond runway ends that lies with the Runway Protection Zones. Due to the historical pattern of development, this is not possible at Reid-Hillview Airport. The runway protection zones for Runways 13R and 13L fall partially on airport property. These runway protection zones also overlie a public street (Ocala Road) and a public park. The runway protection zones for Runway 31L and 31R include some airport property, a major arterial (Tully Road) and portions of an adjacent shopping mall. Only one building (a bank) lies within the section of the runway protection zones that overlies mall property. The optimum mixture of property acquisition and compatibility policies should be defined to maximize safety.

Aesthetics

No significant scenic resources such as trees, rock outcroppings, or historical buildings would be affected by the proposed Master Plan. New development on the airport will need to meet standard site design requirements.

Cultural Resources

There are no known archeological, paleontological resources, or unique geological features within or on the airport site.

Transportation and Traffic

Reid-Hillview Airport is located in the northwest corner of the intersection of Capitol Expressway and Tully Road. This intersection suffers from congestion. Based upon available data, this intersection appears to be operating at a level of service D during the peak hour of PM traffic and level of service F during the peak hour of AM traffic.

Level of Service D at signalized intersections as stated in the Highway Capacity Manual prepared by the Transportation Research Board describes operations with delays greater than 25 and up to approximately 40 seconds per vehicle. At level D the influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high volume per capacity ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. The average delay for vehicles at this intersection is 44.3 seconds.

Level of Service F as stated in the Highway Capacity Manual describes operations with delay in excess of 60 seconds per vehicle. This level, considered to be unacceptable to most drivers, often occurs with oversaturation, that is, when the ratio of arrival flow rate to actual capacity exceeds 1.00. This occurs during the peak AM traffic condition at this intersection. The right turn movement for westbound traffic exhibits a volume per capacity ratio of 1.56, and the left turn movement for southbound traffic exhibits a volume per capacity ratio of 1.04. The average delay for vehicles at this intersection is 82.1 seconds.

An increase in vehicle trips at Reid-Hillview Airport may contribute to the existing congestion. This is a potentially significant issue that should be evaluated in detail as part of the environmental documentation process. An order-of-magnitude estimate of the traffic impacts of the proposed master plan has been made assuming that the growth in traffic will be proportionate to the growth in based aircraft.

Current airport vehicle counts were taken in June 2004 by Santa Clara County's Department of Roads and Airports. During the sample period, vehicle trips ranged from 2 to 86 trips per hour and 1,405 to 1,745 vehicle trips daily. The number of trips averaged 1,558 on weekdays and 1,218 on weekends.

The number of based aircraft for Reid-Hillview Airport is forecast to increase from 687 to 750 over the next 20 years. If vehicular traffic due to aviation uses increase proportionately to the increase in based aircraft, the number of trips would increase to between 2 to 92 vehicle trips per hour, and 1,503 to 1,867 vehicle trips per day. This would equate to 6 more trips per hour, and 98 to 122 per day.

This increase does not include traffic increases due to nonaviation uses. Because specific uses have not been identified for the parcels designated for nonaviation uses, traffic generation has not been estimated. Traffic generation for a range of plausible uses should be documented in the environmental documents.

The relocation of the existing baseball fields from Cunningham and Swift, to Cunningham near Tymn Way will remove some existing traffic from the adjacent segments of Capitol Expressway and Tully Road. This traffic will be shifted to the section of Cunningham Avenue that passes through the residential area west of the airport. Data does not currently exist to quantify the volume of activity. This data should be developed to aid in the analysis of the effect of relocation of the ball fields.

Integrated Noise Model Inputs

- The number of operations by aircraft type or group.
- The distribution of operations by time of day for each aircraft type.
- The average takeoff profile and standard approach slope used by each aircraft type.
- The amount of noise transmitted by each aircraft type, measured at various distances from the aircraft.
- The runway system configuration and runway lengths.
- Runway utilization distribution by aircraft type and time of day.
- The geometry of common aircraft flight tracks.
- The distribution of operations for each flight track.

Noise Effects

Noise is often described as unwanted or disruptive sound. Because of its routine, everyday occurrence, it is usually perceived as the most significant adverse impact of airport activity. This section will evaluate the noise effects of implementation of the master plan.

A pure sound is measured in terms of: its magnitude, (often thought of as loudness) as indicated on the decibel (dB) scale; its frequency, (or tonal quality) measured in cycles per second (hertz); and its duration or length of time over which it occurs. To measure the noise value of a sound or series of sounds, other factors must also be considered. Airport noise is particularly complex to measure because of the widely varying characteristics of the individual sound events and the intermittent nature of these events' occurrence.

In an attempt to provide a single measure of airport noise impacts, various cumulative noise level metrics have been devised. The metric most commonly used in California is the Community Noise Equivalent Level (CNEL). This measure is similar to the Day-Night Average Sound Level (DNL or L_{dn}) metric used elsewhere in the United States. The results of CNEL calculations are normally depicted by a series of contours representing points of equal noise exposure in 5 dB increments. Key factors involved in calculation CNEL contours are noted to the left.

Noise contours were prepared using the FAA's Integrated Noise Model (Version 6.1). The results are presented in Figures D-1, D-2, and D-3. Figure D-1 presents the noise contours for the current (2002) activity level. Figure D-2 depicts the contours for 2007. Noise contours for 2022 are presented in Figure D-3. Noise model inputs are presented in Appendix A. The first two noise contour graphics are taken from the Part 150 Noise Management Program. Implementation of the measures contained in the Noise Management Program will reduce the effects of the forecast growth. If the forecast growth occurs, additional residents will qualify for the home insulation program. The need for other mitigation measures should be assessed.

Air Quality

The volume of aircraft use is forecast to increase over the 20-year planning period. Growth in aircraft use will result in a parallel growth in automobile use. Both of these will cause an incremental increase in air pollutants attributable to airport operations. Construction activities will also create short-term increases in air pollution. Basic modeling is appropriate to quantify air quality impacts of Master Plan projects. Due to the proximity the heavily congested intersection of Tully Road and Capital Expressway, modeling of hot spots may be warranted.

Physical

Reid-Hillview Airport is physically constrained due to its proximity to a highly developed and urbanized area of Santa Clara County. Expansion of the physical boundaries of the airport is nearly impossible because the airport is surrounded by urban development, and is physically bound to the northeast by Capitol Expressway, and to the east by Tully Road.

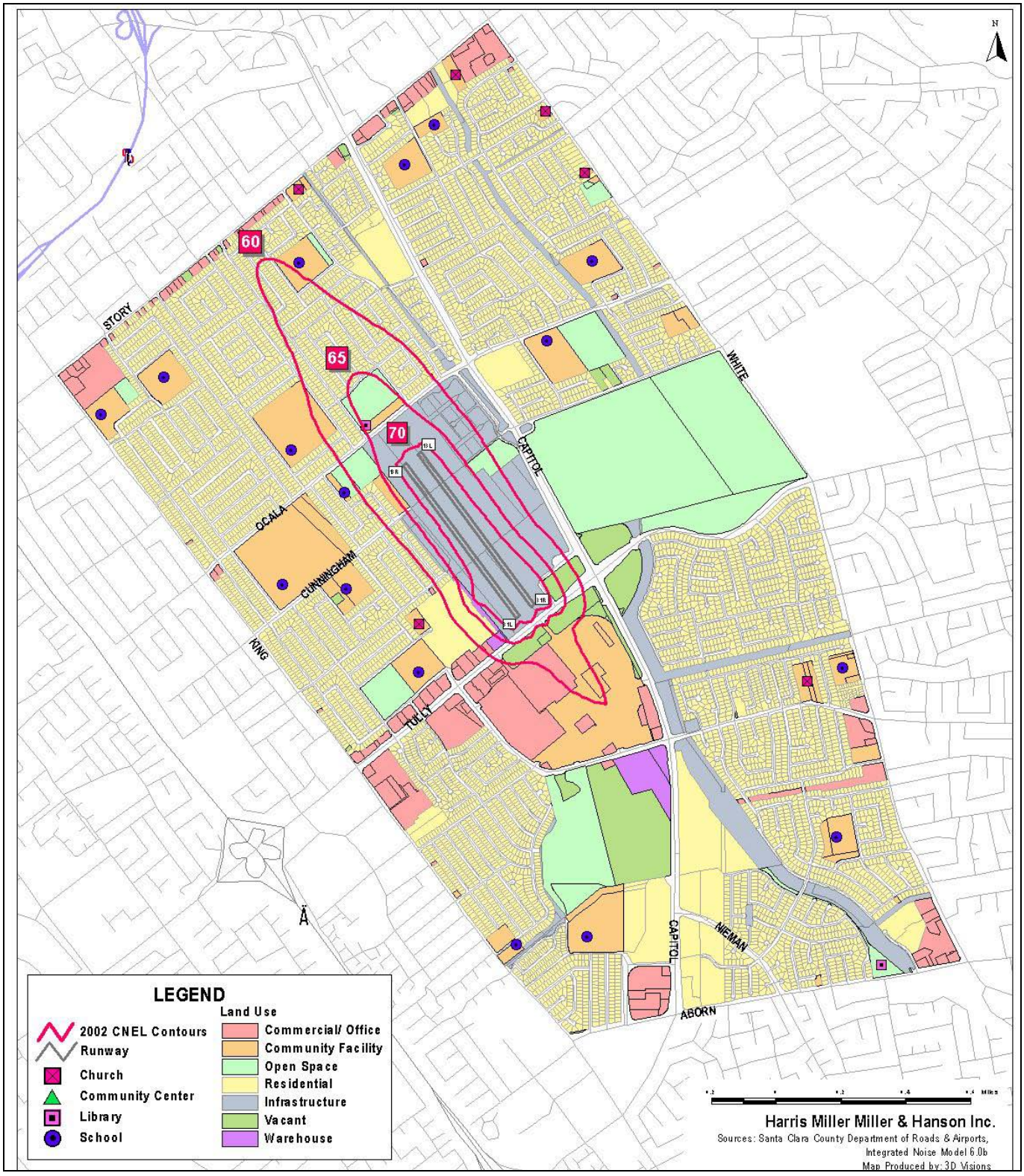


Figure D-1

Noise Contours – 2002

Reid-Hillview Airport

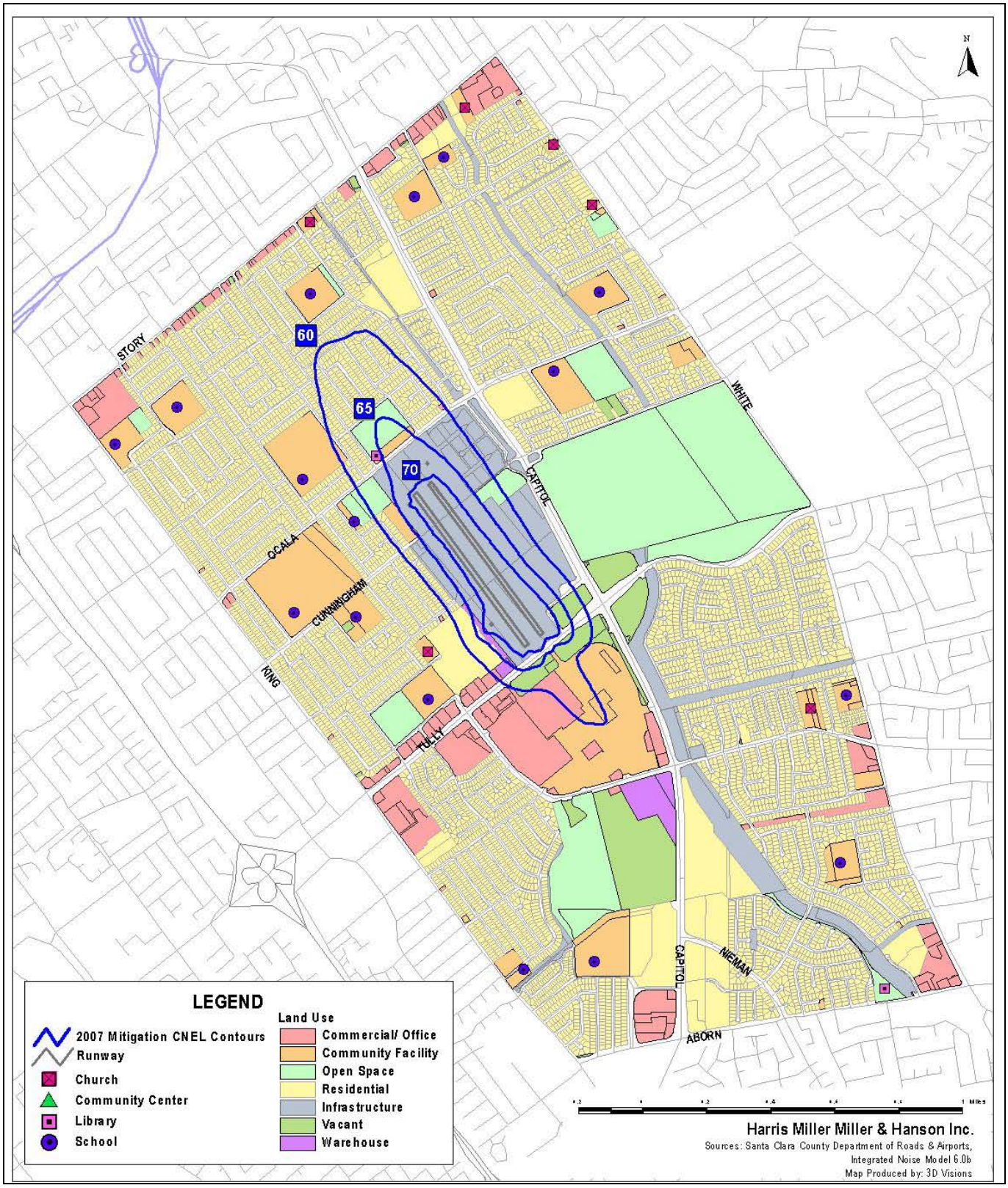
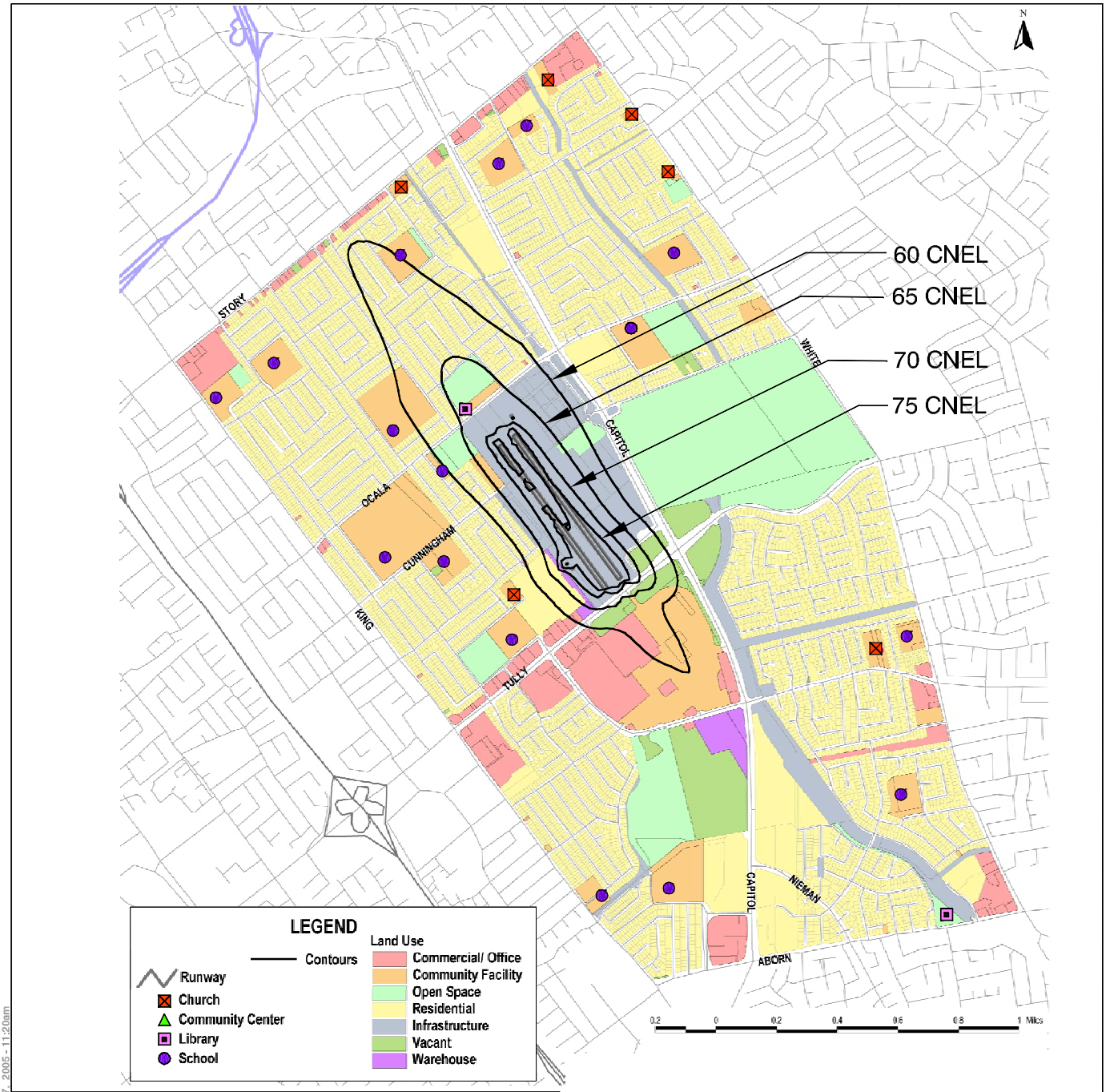


Figure D-2

Noise Contours – 2007

Reid-Hillview Airport



20-Year Forecast (2022)	
Annual Operations	245,986
Average Annual Day	328

Source: Harris Miller Miller & Hanson, Inc.

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Figure D-3

Noise Contours - 2022

Reid-Hillview Airport

Hydrology

The majority of Reid-Hillview Airport is located outside of the 100-year floodplain. According to Federal Emergency Management Agency (FEMA) Rate Maps Community Panel 060337-0255 and 060349-0026, only the northeastern corner of the airport property, north of the entrance and east of the existing FBOs, is designated as within the 100-year shallow flood zone with an average depth of inundation at 1 foot. Proposed future commercial and transit development may occur within this designated flood hazard area.

There are no known mudslide hazards affecting Reid-Hillview Airport. Tsunamis are unlikely to reach the project site since it is located away from coastal areas.

Environmental Review

Environmental review under the provisions of the California Environmental Quality Act will be required before this plan can be adopted. Given the sensitive nature of the runway modifications, and the traffic impacts to Capital Expressway and its intersection with Tully Road, and Environmental Impact Report is likely to be appropriate. However, the decision of whether to prepare an environmental impact report or a mitigated negative declaration will rest with Santa Clara County.

It is anticipated that an Environmental Assessment will need to be prepared under the provisions of the National Environmental Policy Act to address the proposed runway modifications. While it is possible that an Environmental Impact Statement might be needed, the magnitude of project's impacts does not seem to warrant this approach. Ultimately this decision will rest with the Federal Aviation Administration.

Airport Plan Drawings

RUNWAY END DATA

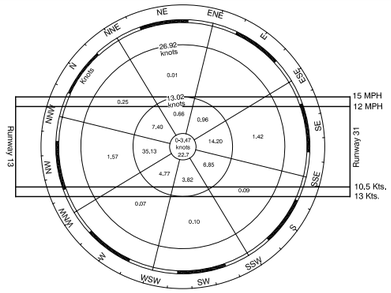
APPROACH END OF RUNWAY:			13L	31R	13R	31L
RUNWAY END COORDINATES (a)	Latitude	Existing	37° 20' 11.46" N	37° 19' 47.01" N	37° 20' 09.66" N	37° 19' 45.23" N
		Future	37° 20' 12.20"N	No Change	37° 20' 10.29"N	No Change
	Longitude	Existing	121° 49' 21.36" W	121° 48' 58.20" W	121° 49' 24.33" W	121° 49' 01.17"W
		Future	121° 49' 22.06" W	No Change	121° 49' 24.92"W	No Change
RUNWAY END ELEVATIONS (a)		Existing	124'	136'	123'	134'
		Future	No Change	No Change	No Change	No Change
RUNWAY MARKINGS		Existing	Visual	Visual	Visual	Visual
		Future	No Change	No Change	No Change	No Change
RUNWAY TOUCH DOWN ZONE ELEVATION		Existing	133'	130'	131'	128'
		Future	No Change	No Change	No Change	No Change
NAVIGATION AIDS		Existing	None	None	GPS	None
		Future	No Change	No Change	No Change	No Change
VISUAL AIDS		Existing	VASI 4°, REIL	VASI 4°, REIL	None	VASI 4°
		Future	No Change	No Change	No Change	No Change
APPROACH TYPE (FAR Part 77 Category)		Existing	Visual [A(V)]	Visual [A(V)]	Visual [A(NP)]	Visual [A(V)]
		Future	No Change	No Change	No Change	No Change
APPROACH VISIBILITY (Minimums)		Existing	Visual	Visual	1 1/4 MI. Straight-in	Visual
		Future	No Change	No Change	No Change	No Change
APPROACH SLOPE (Required/Clear)		Existing	20:1/42:1	20:1/37:1	20:1/39:1	20:1/33:1
		Future	No Change	No Change	No Change	No Change
RUNWAY SAFETY AREA (Width)		Existing	120'	120'	120'	120'
		Future	No Change	No Change	No Change	No Change
RUNWAY SAFETY AREA (Length Beyond Runway End)		Existing	684'	147' (c)	668'	161' (c)
		Future	591'	No Change	589'	No Change
OBSTACLE FREE ZONE (Width)		Existing	250'	250'	250'	250'
		Future	No Change	No Change	No Change	No Change
OBSTACLE FREE ZONE (Length Beyond Runway End)		Existing	200'	200'	200'	200'
		Future	No Change	No Change	No Change	No Change
OBJECT FREE AREA (Width)		Existing	250'	250'	250'	250'
		Future	No Change	No Change	No Change	No Change
OBJECT FREE AREA (Length Beyond Runway End)		Existing	684'	147' (c)	668'	161' (c)
		Future	No Change	No Change	No Change	No Change
HOLD LINE (DISTANCE FROM RUNWAY CL)		Existing	125'	125'	125'	125'
		Future	No Change	No Change	No Change	No Change

AIRPORT DATA

		EXISTING	FUTURE
AIRPORT REFERENCE CODE		B-I (small)	No Change
AIRPORT REFERENCE POINT (a)	Latitude	37° 19' 58.34" N	37° 19' 58.68" N
	Longitude	121° 49' 11.26" W	121° 49' 11.58" W
AIRPORT ELEVATION (Above Mean Sea Level)		136'	No Change
MEAN MAX. TEMP. (Hottest Month)		84.0° F (July)	No Change
AIRPORT AND TERMINAL NAVIGATIONAL AIDS		Beacon, VOR/DME	No Change
GPS APPROACH ESTABLISHED		Yes	No Change
AIRPORT ACREAGE	Fee Simple	179	186
	Avigation Easement	19	27
AIRCRAFT PARKING SPACES	Tiedowns	460	No Change
	Hangar Units	185	222
	Helicopter	5	No Change

RUNWAY DATA

		RUNWAY 13L-31R		RUNWAY 13R-31L	
		EXISTING	FUTURE	EXISTING	FUTURE
AIRPORT REFERENCE CODE		B-I (small)	No Change	B-I (small)	No Change
CRITICAL AIRCRAFT	AIRCRAFT	Baron 58	No Change	Baron 58	No Change
	WINGSPAN	37.8'	No Change	37.8'	No Change
	UNDERCARRIAGE WIDTH	>7'	No Change	>7'	No Change
	APPROACH SPEED (kts.)	96	No Change	96	No Change
	MAX. TAKEOFF WT. (lbs.)	5,500	No Change	5,500	No Change
PHYSICAL LENGTH AND WIDTH		3,101 x 75'	3,194' x 75'	3,099' x 75'	3,178' x 75'
RUNWAY HIGH POINT		133'	No Change	131'	No Change
RUNWAY LOW POINT		121'	No Change	120'	No Change
VERTICAL LINE OF SIGHT PROVIDED		Yes	No Change	Yes	No Change
EFFECTIVE GRADIENT (%)		0.48%	No Change	0.48%	No Change
MAXIMUM GRADIENT (%)		0.75%	No Change	1.25%	No Change
RUNWAY/TAXIWAY SURFACE TYPE		Asphalt	No Change	Asphalt	No Change
PAVEMENT STRENGTH (1,000#) - S/D/DT		17/-/-	No Change	17/-/-	No Change
RUNWAY EDGE LIGHTING		MIRL	No Change	None	No Change



ALL WEATHER WIND ROSE

WIND COVERAGE

Runway	12 M.P.H. (10.5 Knots)	15 M.P.H. (13 Knots)
13L-31R	98.75%	99.61%
13R-31L	98.75%	99.61%
Combined	98.75%	99.61%

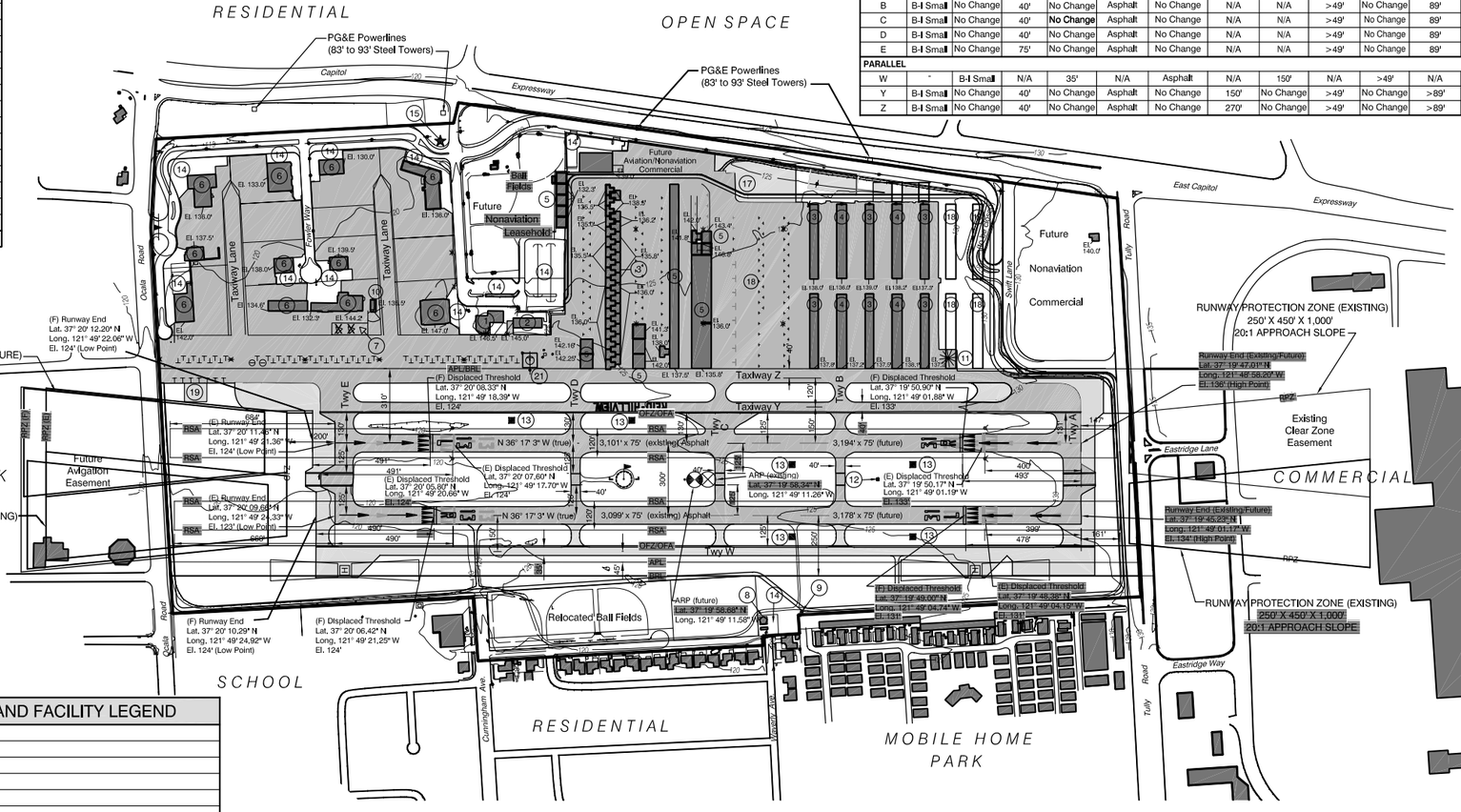
SOURCE: RECORDS OF SAN JOSE WEATHER STATION, DEPARTMENT OF PUBLIC WORKS, COOPERATIVE STATION OF THE U.S. WEATHER BUREAU, 1937-1947.

PROPOSED DECLARED DISTANCES

		13L	31R	13R	31L
TAKEOFF RUN AVAILABLE	TORA	3,194'	3,194'	3,178'	3,178'
TAKEOFF DISTANCE AVAILABLE	TODA	3,194'	3,194'	3,178'	3,178'
ACCELERATE-STOP DISTANCE AVAILABLE	ASDA	3,101'	3,194'	3,099'	3,178'
LANDING DISTANCE AVAILABLE	LDA	2,703'	2,701'	2,609'	2,700'

TAXIWAY DATA

TAXIWAY EXIT	DESIGN GROUP EXISTING	DESIGN GROUP FUTURE	WIDTH EXISTING	WIDTH FUTURE	SURFACE TYPE EXISTING	SURFACE TYPE FUTURE	RWY CL. to TWY CL. EXISTING	RWY CL. to TWY CL. FUTURE	TAXIWAY SAFETY AREA WIDTH EXISTING	TAXIWAY SAFETY AREA WIDTH FUTURE	TAXIWAY OBJECT FREE AREA WIDTH EXISTING	TAXIWAY OBJECT FREE AREA WIDTH FUTURE	TWY. CL. to FIXED or MOVEABLE OBJECT EXISTING	TWY. CL. to FIXED or MOVEABLE OBJECT FUTURE	TAXIWAY WINGTIP CLEARANCE EXISTING	TAXIWAY WINGTIP CLEARANCE FUTURE
A	B-I Small	No Change	75'/100'	130'/150'	Asphalt	No Change	N/A	N/A	>49'	No Change	89'	No Change	>45'	No Change	20'	No Change
B	B-I Small	No Change	40'	No Change	Asphalt	No Change	N/A	N/A	>49'	No Change	89'	No Change	>45'	No Change	20'	No Change
C	B-I Small	No Change	40'	**No Change**	Asphalt	No Change	N/A	N/A	>49'	No Change	89'	No Change	>45'	No Change	20'	No Change
D	B-I Small	No Change	40'	No Change	Asphalt	No Change	N/A	N/A	>49'	No Change	89'	No Change	>45'	No Change	20'	No Change
E	B-I Small	No Change	75'	No Change	Asphalt	No Change	N/A	N/A	>49'	No Change	89'	No Change	>45'	No Change	20'	No Change
PARALLEL																
W	-	B-I Small	N/A	35'	N/A	Asphalt	N/A	150'	N/A	>49'	N/A	89'	N/A	45'	N/A	20'
Y	B-I Small	No Change	40'	No Change	Asphalt	No Change	150'	No Change	>49'	No Change	>89'	No Change	>45'	No Change	20'	No Change
Z	B-I Small	No Change	40'	No Change	Asphalt	No Change	270'	No Change	>49'	No Change	>89'	No Change	>45'	No Change	20'	No Change



DRAWING LEGEND

	EXISTING	FUTURE
ACTIVE AIRFIELD PAVEMENT		
OTHER PAVEMENT IN USE		
AIRPORT PROPERTY LINE		
OTHER PROPERTY LINES		
AVIGATION EASEMENT		
INTERNAL BOUNDARY (lease, R.O.W., etc.)		
CRITICAL AIRFIELD AREAS *	XYZ	XYZ
BUILDING		
FENCE		
VEHICLE GATE		
WIND CONE		
AIRFIELD LIGHTS: SINGLE/GROUP/FLASHING		
BEACON		
UTILITY POLE / POWER LINE		
TOPOGRAPHIC CONTOURS	XXX	
WATERWAY / CULVERT		
CHANNEL		
AIRPORT REFERENCE POINT		
SECTION CORNER (b)	16 12	

* Applicable to the following:
APL - Aircraft Parking Limits
BRL - Building Restriction Line
OFA - Object Free Area
OFZ - Obstacle Free Zone
RPZ - Runway Protection Zone
RSA - Runway Safety Area

BUILDING AND FACILITY LEGEND

1. Terminal Building
2. Maintenance Building
3. T-Hangars
4. Aircraft Shelters
5. Aircraft Box Hangars
6. Fixed Base Operator
7. FBO
8. Air Traffic Control Tower (el. 170', top of handrail)
9. Electrical Vault
10. Fuel Island
11. Compass Rose
12. Cellometer
13. VASI
14. Automobile Parking
15. Beacon Tower
16. (Not Used)
17. Future Fuel Farm
18. Future Storage Hangars
19. Future Compass Rose
20. Future Aircraft Parking
21. Future Helicopter Parking

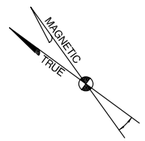
Note: Elevations of structures shown in the drawing.

ALP NOTES

(a) Airport coordinate data source: National Oceanic and Atmospheric Administration (NOAA) Obstruction Chart dated May 4, 1992. Data is NAD 83 and NAVD 88. NOAA's VERTCON program used to convert original NGVD 29 data to NAVD 88.

(b) The airport is in Township 7 South, Range 1 East. This quadrangle has not been sectioned.

(c) Nonstandard Conditions:
- Runway Safety Area and Object Free Area for Runway 31L & Runway 31R is less than 300'.
- Declared distances established.



DECLINATION:
14° 37' E
MARCH 2005
ANNUAL RATE OF CHANGE
0° 5' W

300'
0 FEET 600'

SUBMITTED BY:
County of Santa Clara

By _____ Date

FAA Approval Space

NO.	REVISION	SPONSOR	DATE

REID-HILLVIEW AIRPORT
SAN JOSE, CALIFORNIA
AIRPORT LAYOUT PLAN

MEAD & HUNT
ENGINEERS ARCHITECTS SCIENTISTS PLANNERS
707 Aviation Blvd., Santa Rosa, California 95403 • (707) 526-5010

DESIGN:	DD/MT	DRAWN:	TE/GJ	DATE:	June 2007	SHEET	1	OF	3

The preparation of these documents was financed in part through a planning grant from the Federal Aviation Administration as provided under Section 505 of the Airport and Airway Improvement Act of 1982, as amended. The contents do not necessarily reflect the official views or policy of the FAA. Acceptance of these documents by the FAA does not in any way constitute a commitment on the part of the United States to participate in any development depicted herein nor does it indicate that the proposed development is environmentally acceptable in accordance with appropriate public laws.

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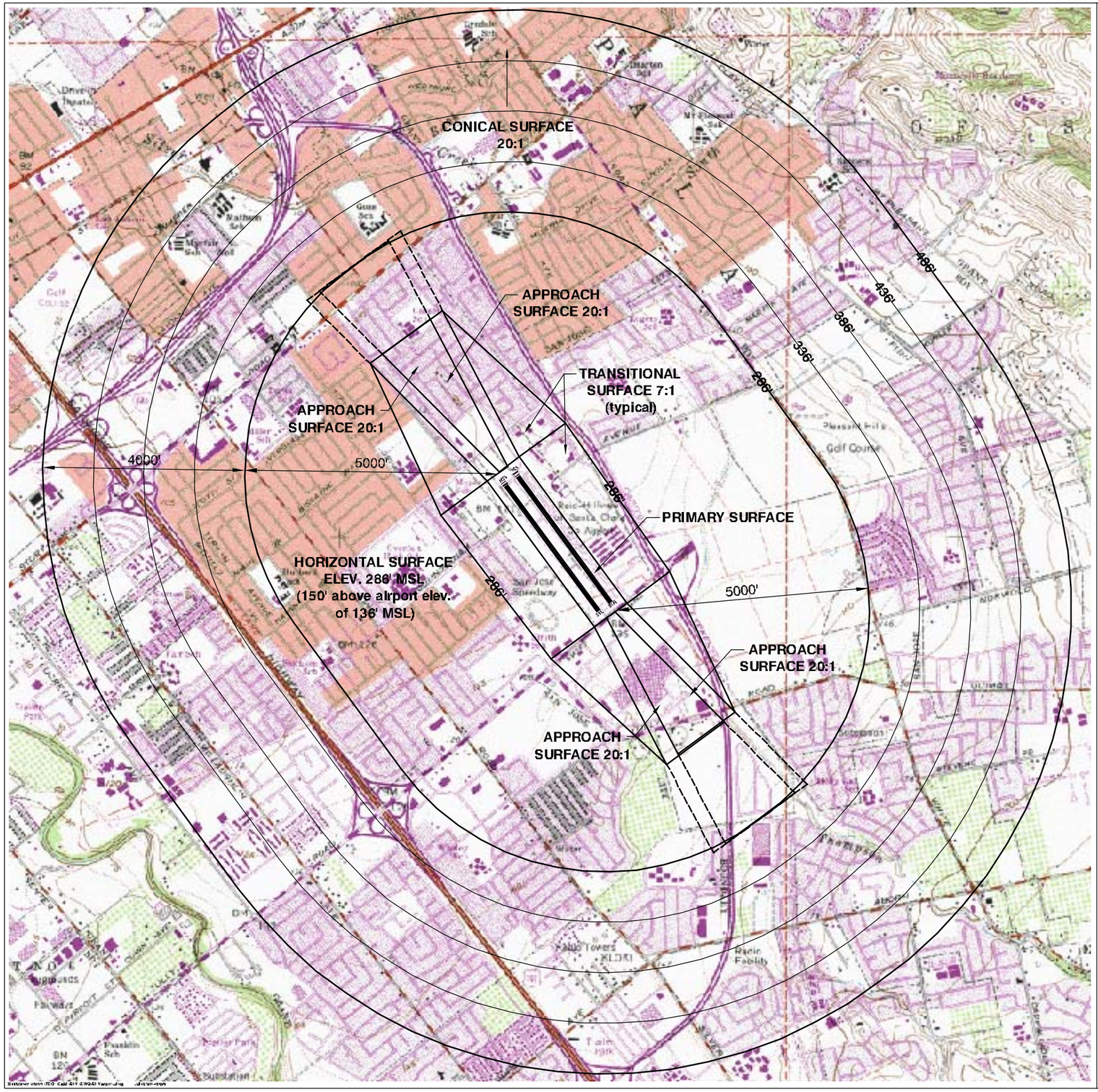
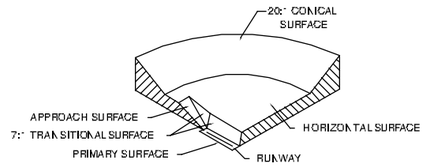




TYPICAL FAR PART 77 SURFACES

NOTES:

All elevations in feet above mean sea level (MSL) and NAVD88.

No terrain penetration of indicated surfaces.

SOURCES:

Reid-Hillview Airport Obstruction Chart No. OCS681

USGS Topographic Maps

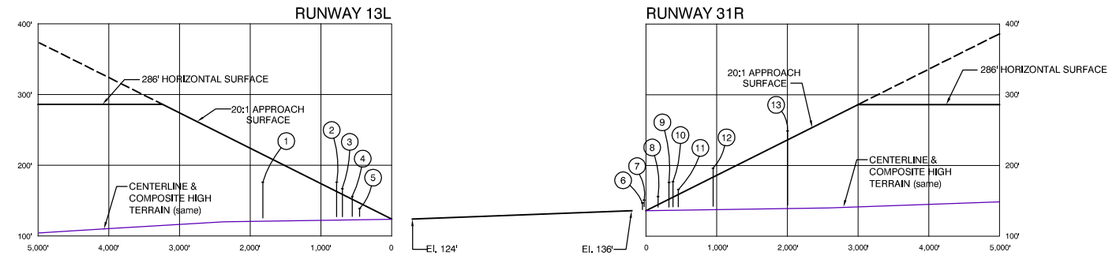
NO.	REVISION	SPONSOR	DATE

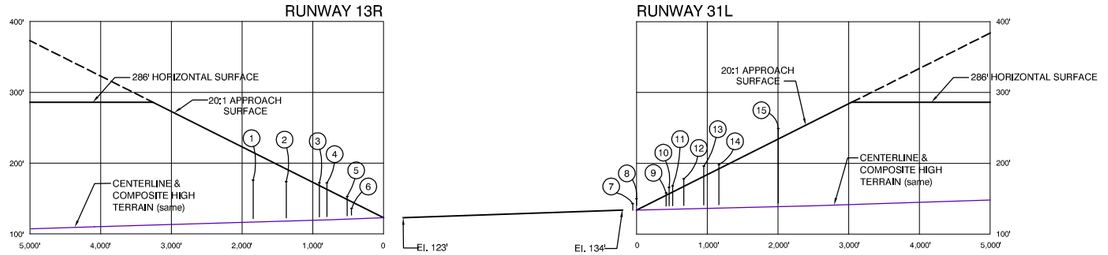
REID-HILLVIEW AIRPORT
SAN JOSE, CALIFORNIA

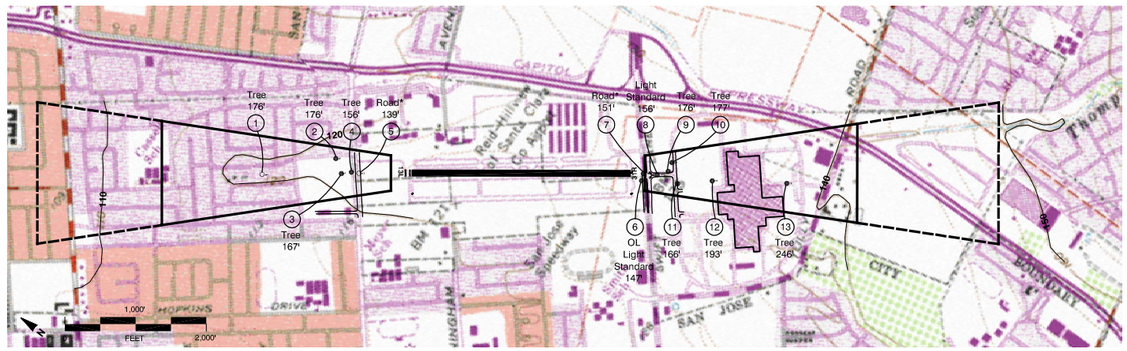
AIRSPACE PLAN

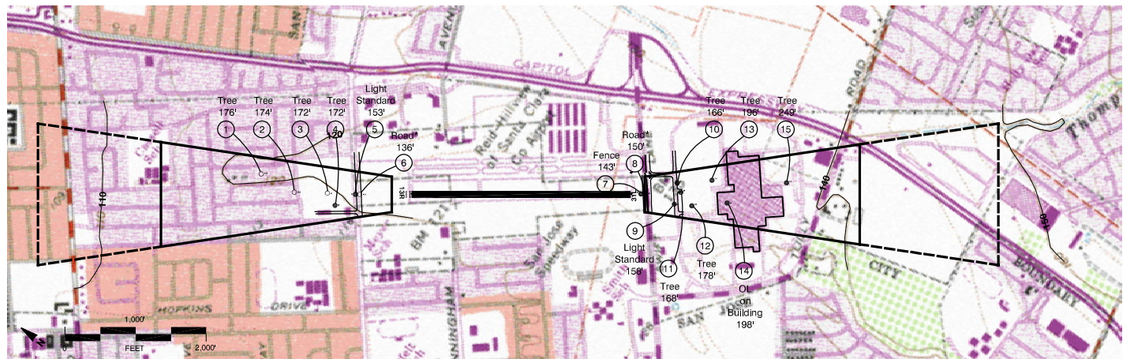
MEAD & HUNT — ENGINEERS ARCHITECTS SCIENTISTS PLANNERS

DESIGN: DD	DRAWN: TE	DATE: June 2007	SHEET 2 OF 3









LEGEND

- ● = Object penetrates indicated surface
- ○ = Object falls outside or below indicated surface
- * = 15 feet vertical clearance added to road elevations

NOTES:

All elevations in feet above mean sea level (MSL) and NAVD88

SOURCES:

Reid-Hillview Airport Obstruction Chart No. OC5591
USGS Topographic Maps

NO.	REVISION	SPONSOR	DATE

REID-HILLVIEW AIRPORT
SAN JOSE, CALIFORNIA

APPROACH SURFACE DETAIL

MEAD & HUNT
ENGINEERS ARCHITECTS SCIENTISTS PLANNERS
707 Aviation Blvd., Santa Rosa, California 95403 - (707) 526-5010

DESIGN:	DD	DRAWN:	TE	DATE:	June 2007	SHEET	3	OF	3

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